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The Auk

A Quarterly Journal of Ornithology

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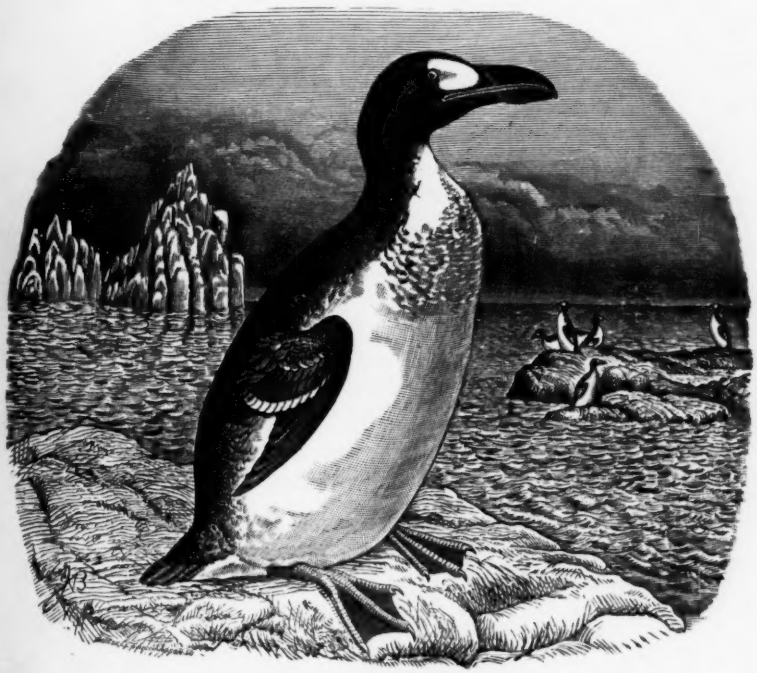

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[1] 'The Auk' is indebted for Plates II and III to Mr. John E. Thayer.

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LEGGE, WILLIAM V., Cullenswood House, St. Mary's, Tasmania....1891
MACFARLANE, RODERICK, Winnipeg, Manitoba.....1886
MADARÁSZ, Dr. JULIUS VON, National Museum, Budapest, Hungary.1884
MENZBIER, Dr. M., Imperial Society of Naturalists, Moscow.....1884
NAMIYE, M., Tokio.....1886
NICHOLSON, FRANCIS, The Knoll, Windermere, England.....1884
NORTH, ALFRED J., Australian Museum, Sydney, New South Wales..1902
OATES, EUGENE WILLIAM, 1 Carlton Gardens, Ealing, London, W...1884
PALMÉN, Dr. J. T., Helsingfors, Finland.....1838
PYCRAFT, W. P., British Museum (Nat. Hist.), Cromwell Road, London, S. W.....1902
RAMSEY, E. P., Sydney, New South Wales.....1884
RINGER, FREDERIC, Nagasaki.....1888
ROTHSCHILD, Hon. WALTER L., Zoölogical Museum, Tring, England.1898
SCHALOW, HERMAN, Traunsteinerstrasse 2[1], Berlin, W. 30.....1884
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SUSHKIN Dr. PETER, Imperial University, Moscow.....1903
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TSCHUSI ZU SCHMIDHOFFEN, VICTOR RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....1884
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WORCESTER, Prof. DEAN C., Manila, P. I.....1903
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BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....1901
BURNETT, WILLIAM L., Box 337, Loveland, Colo.....1895
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BURTCH, VERDI, Branchport, N. Y. 1903
BUTLER, Miss CHARLOTTE W., 500 Audubon Road, Boston, Mass. .. 1904
BUXBAUM, Mrs. CLARA E., St. Joseph, Mich. 1895
CABOT, LOUIS, Brookline, Mass. 1904
CADUC, Eugene E., 14 Derne St., Boston, Mass 1910
CALLENDER, JAMES PHILLIPS, 603 Springfield Ave., Summit, N. J. .. 1903
CAREY, HENRY R., Milton Academy, Milton, Mass. 1908
CARPENTER, Rev. CHARLES KNAPP, 183 Fox St., Aurora, Ill. 1894
CARPENTER, GEORGE I., 696 Halsey St., Brooklyn, N. Y. 1907
CARRIKER, M. A., Jr., Amer. Mus. Nat. Hist., New York City 1907
CARTER, JOHN D., Lansdowne, Pa. 1907
CASE, Rev. BERT F., Richmond Beach, Wash. 1903
CASE, CLIFFORD M., 7 Holcomb St., Hartford, Conn. 1892
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CATLIN, JAMES P., Ottawa, Ill. 1905
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CHAMBERS, W. LEE, Box 73D, Los Angeles, Cal. 1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass. .. 1896
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CHARLES, FRED LEMAR, University of Illinois, Urbana, Ill. 1908
CHASE, Mrs. AGNES, Dept. of Agriculture, Washington, D. C. 1896
CHASE, SIDNEY, Nantucket, Mass. 1904
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CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass. 1896
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FULLER, T. OTIS, Needham, Mass.....1904
FUTCHER, Dr. THOMAS B., 23 W. Franklin St., Baltimore, Md.....1906
GAINES, EDWARD F., Ritzville, Wash.....1908
GANO, Miss LAURA, 744 National Road, W., Richmond, Ind.....1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.....1903
GARRICK, JAMES P., Jr., Weston, S. C.....1906
GATH, JOHN, Box 236, Torrington, Conn.....1901
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.....1904
GIFFORD, EDWARD WINSLOW, Cal. Acad. Sci., San Francisco, Cal.....1904
GILMAN, M. FRENCH, Sacaton, Arizona.....1907
GOODALE, Dr. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.....1885
GOODELL, Mrs. JAMES P., Rhinebeck, N. Y.....1909
GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill.....1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass.....1904

GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.....1889
GRAHAM, WM. J., Aledo, Ill.....1909
GRANGER, Miss HELEN, Wilder Hall, Amherst, Mass.....1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City.....1891
GRANT, Mrs. H. T., 187 Bowen St., Providence, R. I.....1909
GRANT, WM. H., Englewood, N. J.....1910
GRAVES, Mrs. CHARLES B., 66 Franklin St., New London, Conn.....1905
GREENOUGH, HENRY VOSE, 23 Monmouth Court, Brookline, Mass...1901
GREGORY, STEPHEN S., Jr., 1349 Astor St., Chicago, Ill.....1906
GRISCOM, LUDLOW, 21 Washington Sq., N., New York City.....1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C.....1909
GROSS, ALFRED O., 39 College House, Cambridge, Mass.....1907
HADLEY, ALDEN H., Monrovia, Indiana.....1906
HALES, HENRY, Ridgewood, N. J.....1890
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y...1910
HALL, H. PORTER, Leominster, Mass.....1904
HAMILTON, Dr. B. A., Highland Park, Ill.....1909
HANKINSON, THOS. LEROY, Charleston, Ill.....1897
HANN, HERBERT H., Mt. Hood, Oregon.....1903
HARDON, Mrs. HENRY W., 315 West 71st St., New York City.....1905
HARDY, JOHN H., Jr., Littleton, Mass.....1905
HARPER, FRANCIS, 557 First Ave., College Point, N. Y.....1907
HARPER, Mrs. MARY McC., 102 Pennsylvania Ave., Wilmington, Del.1910
HART, CHARLES G., Box 47, East Berlin, Conn.....1908
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio.....1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill.....1905
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....1897
HAVEMEYER, H. O., Jr., 113 Wall St., New York City.....1893
HAZARD, Hon. R. G., Peace Dale, R. I.....1885
HEIL, CHARLES E., Needham, Mass.....1908
HELME, ARTHUR H., Miller Place, N. Y.....1888
HENDERSON, Judge JUNIUS, Boulder, Colo.....1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....1885
HENN, ARTHUR WILBUR, Indian University, Bloomington, Ind.....1909
HENNINGER, Rev. WALTHER F., New Bremen, Ohio.....1898
HERRICK, HAROLD, 25 Liberty St., New York City.....1905
HERSEY, LUMAN J., 2121 W. 34th Ave., Denver, Colo.....1909
HESS, ISAAC E., Philo, Ill.....1909
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....1900
HILL, JAMES HAYNES, Box 485, New London, Conn.....1897
HILL, Mrs. THOMAS R., 4629 Baltimore Ave., Philadelphia, Pa.....1903
HINE, ASHLEY, 615 Isabella St., Edmonton, Alberta.....1909
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....1899
HINE, Mrs. JANE L., Sedan, Ind.....1890
HITCHCOCK, FRANK H., Metropolitan Club, Washington, D. C.....1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....1904

HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....1899
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....1902
HOLDEN, Mrs. EDWIN B., 323 Riverside Drive, New York City.....1903
HOLLAND, HAROLD MAY, 5322 Ellis Ave., Chicago, Ill.....1910
HOLLAND, Dr. WILLIAM J., Carnegie Institute, Pittsburgh, Pa.....1899
HOLLISTER, WARREN D., 620 McPhea Bld'g., Denver, Colo.....1901
HOLMAN, RALPH H., 33 Chestnut St., Stoneham, Mass.....1907
HOLT, Mrs. NANCY W. C., 136 Chauncey St., Cambridge, Mass.....1908
HONYWILL, ALBERT W., Jr., 171 Ellsworth Ave., New Haven, Conn..1907
HORSFALL, BRUCE, Acampo, Cal.....1905
HOWELL, A. BRAZIER, 250 N. Orange Grove Ave., Pasadena, Cal...1909
HOWELL, BENJAMIN F., Jr., R. F. D. 1, Boonton, N. J.....1907
HOWE, CARLTON D., Essex Junction, Vt.....1901
HOWE, Miss LOUISE, 53 Linden St., Brookline, Mass.....1908
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass...1895
HOXIE, WALTER J., 1522 Bull St., Savannah, Ga.....1909
HOYT, Miss ANNIE S., 121 Madison Ave., New York City, N. Y....1909
HOYT, WILLIAM H., Box 425, Stamford, Conn.....1907
HUBBARD, Dr. LUCIUS L., Houghton, Mich.....1907
HUBBARD, Mrs. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....1891
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....1895
HUNT, CHRESWELL J., 2337 S. Paulina St., Chicago, Ill.....1902
HUTCHINSON, Dr. W. F., Box 42, Portsmouth, Va.....1910
INGALLS, CHARLES E., East Templeton, Mass.....1885
INGERSOLL, ALBERT M., Box 843, San Diego, Cal.....1885
IRVING, JOHN, 52 Broadway, Glen Cove, N. Y.....1894
ISHAM, C. B., 30 E. 63d St., New York City.....1891
IVES, ROY C., R. R. No. 2, Clare, Iowa.....1908
JACKSON, HARTLEY, H. T., Biological Survey, Washington, D. C.....1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....1888
JAMES, Mrs. I. M., 105 W. Court St., Doylestown, Pa.....1909
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....1905
JESSUP, J. M., Smithsonian Institution, Washington, D. C.....1910
JEWEL, LINDSEY L., Gatun, Canal Zone, Panama.....1910
JOHNS, ERWIN WM., Tempe, Arizona.....1910
JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon.....1906
JEWETT, McCORMICK, 205 Yale Station, New Haven, Conn.....1909
JOHNSON, Mrs. GRACE PETTIS, City Library Association, Springfield, Mass.....1908
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y.....1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....1894
JOHNSON, WALTER ADAMS, 18 Gramercy Park, New York City.....1889
JOHNSON, WILLIAM S., Lyons, N. Y.....1893
JORDAN, A. H. B., Lowell, Wash.....1888
JUDD, ELMER T., Cando, N. D.....1895
JUMP, Mrs. EDWIN R., 350 Waltham St., West Newton, Mass.....1910

KALMBACH, EDWIN R., Biological Survey, Washington, D. C.....1910
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....1902
KELLOGG, CHARLES D., North Newry, Maine.....1908
KENNARD, FREDERIC HEDGE, Dudley Road, Newton Centre, Mass...1892
KENT, EDWIN C., 90 West St., New York City.....1907
KERMODE, FRANCIS, Curator Provincial Museum, Victoria B. C.....1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....1904
*KIDDER, NATHANIEL T., Milton, Mass.....1906
KILGORE, WILLIAM, Jr., 1705 4th Ave., S., Minneapolis, Minn.....1906
KILMAN, A. H., Ridgeway, Ontario.....1909
KING, LE ROY, 20 E. 84th St., New York City.....1901
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....1904
KIRKHAM, STANTON D., Milford, Pinewood, S. C.....1910
KIRKWOOD, FRANK C., Long Green, Md.....1892
KITTREDGE, JOSEPH, Jr., 67 Cypress St., Brookline, Mass.....1910
KLOSEMAN, Miss JESSIE E., 4 Spruce St., Dedham, Mass.....1909
KNAEBEL, ERNEST, 3507 Morrison St., Chevy Chase, D. C.....1906
KNAPP, Mrs. HENRY A., 301 Quincy Ave., Scranton, Pa.....1957
KNOLHOFF, FERDINAND WILLIAM, 298 Ridgewood Ave., Glen Ridge.1890
KOHLER, LOUIS SLIDELL, 98 Watsessing Ave., Bloomfield, N. J.....1910
KOPMAN, HENRY HAZLITT, 410 Pine St., New Orleans, La.....1899
KREMER, ROLAND EDWARD, 1720 Vilas St., Madison, Wis.....1909
KUSER, ANTHONY R., Bernardsville, N. J.....1908
KUSER, JOHN DRYDEN, Bernardsville, N. J.....1910
KUSER, Miss SUSIE DRYDEN, Bernardsville N. J.....1910
KUTCHIN, Dr. VICTOR, Green Lake, Wis.....1905
LACEY, HOWARD GEORGE, Kerrville, Texas.....1899
LANCASHIRE, Mrs. JAMES HENRY, Alma, Mich.....1909
LANE, LAWTON W., 121 Franklin St., Lynn, Mass.....1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....1907
LANGMAID, Miss BERTHA, 2 Gordon Terrace, Brookline, Mass.....1908
LANTZ, Prof. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.1885
LARRABEE, AUSTIN P., 548 Mathewson Ave., Wichita, Kan.....1902
LATIMER, Miss CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.....1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa...1902
LAW, J. EUGENE, Hollywood, Cal.....1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City.....1907
LEVEY, W. CHARLESWORTH, 53 Waverly St., Brookline, Mass.....1908
LEWIS, Dr. FREDERIC T., Harvard Medical School, Boston, Mass.....1909
LINCOLN, FREDERICK CHARLES, 3350 Shoshone St., Denver, Colo.....1910
LINTON, CLARENCE B., 125 West Ocean Ave., Long Beach, Cal.....1908
LOOMIS, JOHN A., Mereta, Texas.....1887
LORD, Rev. WILLIAM R., Dover, Mass.....1901
LORING, J. ALDEN, Owego, N. Y.....1889
LOW, ETHELBERT T., 30 Broad St., New York City.....1907

LUM, EDWARD H., Chatham, N. J. 1904
LURVEY, SAMUEL A., Box 161, South West Harbor, Maine 1908
LUTHER, CLARENCE H., 8 McIlley Bldg., Fayetteville, Ark. 1910
MACDOUGALL, GEORGE R., 112 Wall St., New York City 1890
MACKIE, WM. C., 54 Coolidge St., Brookline, Mass. 1908
MACLAY, MARK W., Jr., 70 West 55th St., New York City 1905
MADDOCK, Miss EMELINE, The Belgravia, Philadelphia, Pa. 1897
MAHER, J. E., Windsor Locks, Conn. 1902
MAITLAND, ROBERT L., 141 Broadway, New York City 1889
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass. 1907
MARCH, Prof. JOHN LEWIS, Union College, Schenectady, N. Y. 1903
MARRS, Mrs. KINGSMILL, Saxonville, Mass. 1903
MARSDEN, H. W., Witch Creek, Cal. 1904
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J. 1902
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa. 1907
MATHEWS, F. SCHUYLER, 17 Frost St., Cambridge, Mass. 1908
MAULE, GEO. C., Gum Tree, Pa. 1910
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa. 1900
MCCONNELL, HARRY B., 142 E. Warren St., Cadiz, O. 1904
MCCOOK, PHILIP JAMES, 15 William St., New York City 1895
MCFARLAND, A. C., 1205 E. 60th St., Chicago, Ill. 1909
MCHATTON, Dr. HENRY, Macon, Ga. 1898
MCILHENNY, EDWARD AVERY, Avery Island, La. 1894
MCINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass. .. 1908
MCKECHNIE, FREDERICK BRIDGHAM, Ponkapog, Mass. 1900
MCLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va. ... 1893
MCMILLAN, Mrs. GILBERT, 1 Mercer Circle, Cambridge, Mass. 1902
MEAD, Mrs. E. M., 2465 Broadway, New York City 1904
MERRIAM, CHARLES, Weston, Mass. 1908
MERRIAM, HENRY F., 94 New England Ave., Summit, N. J. 1905
MERRILL, HARRY, Bangor, Maine 1883
MERSHON, W. B., Saginaw, Mich. 1905
METCALF, WILLARD L., 33 West 67th St., New York City 1908
MILLER, CHAS. W., Shawnee-on-Delaware, Pa. 1909
MILLER, JAMES HENRY, Lowville, N. Y. 1904
MILLS, HARRY C., Box 218, Unionville, Conn. 1897
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O. 1900
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan. 1893
MOORE, Miss ELIZ. PUTNAM, 70 West 11th St., New York City 1905
MOORE, ROBERT THOMAS, 46 Mansion Ave., Haddonfield, N. J. 1898
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J. 1910
MORCOM, G. FREAN, 1815 N. Raymond Ave., Pasadena, Cal. 1886
MORGAN, ALBERT, Box 1323, Hartford, Conn. 1903
MORSE, Miss MARGARET, Clark University, Worcester, Mass. 1907
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass. 1905
MURPHEY, Dr. EUGENE E., 444 Tellfair St., Augusta, Ga. 1903

MURPHY, ROBERT C., Brown Univ., Providence, R. I. 1905
MUSGRAVE, JOHN K., 3516 Shady Ave., Allegheny, Pa. 1909
MUSSELMAN, THOMAS EDGAR, Gem City Business College, Quincy, Ill. 1910
MYERS, Mrs. HARRIET W., 306 Ave. 66, Los Angeles, Cal. 1906
MYERS, Miss LUCY F., Brookside, Poughkeepsie, N. Y. 1898
NASH, HERMAN W., Box 264, Pueblo, Colo. 1892
NELSON, EMORY E., 531 Grain Exchange, Winnipeg, Manitoba 1908
NELSON, JAMES ALLEN, Bureau of Entomology, Washington, D. C. ... 1898
NEWHALL, DANIEL S., Strafford, Pa. 1908
NEWMAN, Rev. STEPHEN M., Hagerstown, Md. 1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me. 1890
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York City .. 1901
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan. 1903
NORRIS, J. PARKER, Jr., care of Evening Bulletin, Philadelphia, Pa. .. 1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind. 1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich. 1909
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y. 1897
O'CONNOR, HALDEMAN, 25 N. Front St., Harrisburg, Pa. 1896
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis. 1897
OLDYS, HENRY, Dept. of Agriculture, Washington, D. C. 1896
*OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass. 1900
OSBURN, PINGREE S., 189 E. Colorado St., Pasadena, Cal. 1910
OVERTON, Dr. FRANK, Patchogue, N. Y. 1909
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo. 1897
PACKER, JESSE E., 444 S. 4th St., Darby, Pa. 1910
PAINE, AUGUSTUS G., Jr., 18 West 49th St., New York City 1886
PARKER, Mrs. BENJAMIN W., 4 Hopestill St., Dorchester Centre, Mass. 1909
PARKER, Hon. HERBERT, South Lancaster, Mass. 1904
PARSONS, WILLIAM, Box 422, Manila, P. I. 1909
PAUL, LUCIUS H., 59 West Miller St., Newark, New York 1908
PEABODY, Rev. P. B., Blue Rapids, Kan. 1903
PEARSE, THEED, Ivy, Va. 1907
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa. 1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y. 1903
PECK, MORTON E., 292 N. Summer St., Salem, Ore 1909
PECK, WALTER M., 15 9th St., East Providence, R. I. 1909
PENNINGTON, FRED ALBERT, 515 Chamber of Commerce, Chicago, Ill. 1910
PERRY, Dr. ELTON, 610 Baylor St., Austin, Tex. 1902
PERRY, HENRY JOSEPH, 636 Beacon St., Boston, Mass. 1909
PETERS, ALBERT S., State Bank, Lake Wilson, Minn. 1908
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass. 1904
PHELPS, Mrs. J. W., Box 36, Northfield, Mass. 1899
PHELPS, Mrs. MARIAN VON R., 205 W. 57th St., New York City 1910
PHILIPP, PHILIP B., 220 Broadway, New York City 1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J. 1891
PHILLIPS, JOHN CHARLES, Wenham, Mass. 1904

PILSBURY, FRANK O., Box 592, Walpole, Mass.....1909
PINCHOT, GIFFORD, Washington, D. C.....1910
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....1906
POE, Miss MARGARETTA, 1222 N. Charles St., Baltimore, Md.....1899
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....1894
POND, Miss ELLA J., 160 Lexington Ave., New York City.....1909
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Del.....1901
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....1908
PORTER, LOUIS H., Stamford, Conn 1893
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....1892
PRICE, ARTHUR E., Grant Park, Ill.....1908
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....1906
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....1893
RABORG, WM. A., Jr., Miurkirk, Md.....1909
RAYMOND, Mrs. C. E., 21 3d St., Hinesdale, Ill.....1910
RANKIN, CHAS. S. G., St. George's, Bermuda.....1909
RAVEN, HENRY C., Bay Shore, N. Y.....1908
RAWLE, FRANCIS W., Lock Box 51, Bryn Mawr, Pa.....1907
RAWSON, CALVIN LUTHER, R. F. D. 2, Putnam, Conn.....1885
READ, ALBERT M., 1140 15th St. N. W., Washington, D. C.....1895
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass...1896
REDFIELD, ALFRED C., 56 Plympton St., Cambridge, Mass.....1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass..1897
REDINGTON, ALFRED POETT, Box 66, Santa Barbara, Cal.....1890
REED, CHESTER A., 238 Main St., Worcester, Mass.....1904
REED, Miss EMILY E., 12 Louisburg Sq., Boston, Mass.....1904
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....1900
REED, Mrs. WILLIAM HOWELL, Belmont, Mass.....1904
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....1901
REINBOLD, JOHN C., 576 Main St., Hackensack, N. J.....1909
RHOADS, CHARLES J., Bryn Mawr, Pa.....1895
RICE, JAMES HENRY, Jr., Summerville, S. C.....1910
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...1900
RICHARDSON, C. H., Jr., Stanford University, Cal.....1903
RIDGWAY, JOHN L., Chevy Chase, Md.....1890
RIKER, CLARENCE B., Maplewood, N. J.....1885
ROBBINS, Miss ALMEDA B., Y. M. Library Association, Ware, Mass..1910
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....1906
ROBERTS, WILLIAM ELY, 1920 Spring Garden St., Philadelphia, Pa...1902
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....1903
ROBINSON, LEWIS W., Cresskill, N. J.....1910
ROBINSON, Dr. PHILIP E., 102 Huntington Ave., Boston, Mass.....1908
ROE, CHARLES M., 252 Home Ave., Oak Park, Ill.....1906
*ROGERS, CHARLES H., 5 W. 82d St., New York City.....1904
ROLFE, ALFRED G., care of High School, Pottstown, Pa.....1909
ROLFE, Mrs. PERCIVAL B., 98 State St., Portland, Me.....1909

ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y. 1896
ROSS, GEORGE H., 23 West St., Rutland, Vt. 1904
ROSSIGNOL, GILBERT R., Jr., 2116 Bull St., Savannah, Ga. 1909
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal. 1889
SACKETT, CLARENCE, Rye, N. Y. 1910
SAGE, HENRY M., Menands Road, Albany, N. Y. 1885
SALLEY, FITZHUGH, Charleston Museum, Charleston, S. C. 1907
SALTONSTALL, JOHN LEE, Beverly, Mass. 1909
SANFORD, HARRISON, 65 W. 50th St., New York City 1905
SANTENS, JOSEPH A., Carnegie Museum, Pittsburgh, Pa. 1907
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C. 1906
SAUNDERS, ARETAS A., care of Forest Service, Anaconda, Mont. 1907
SAUVOLA, AUGUSTUS E., Chassell, Mich. 1909
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y. 1895
SAVAGE, WALTER GILES, Delight, Ark. 1898
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill. 1907
SCHMIDT, WALDO, 211 Florida Ave., N. W., Washington, D. C. 1910
SCHMUCKER, Dr. S. C., Rosedale Ave., West Chester, Pa. 1903
SCOTT, HENRY R., 6 Charles River Sq., Boston, Mass. 1909
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa. 1898
SHANNON, WM. PURDY, 1170 Broadway, New York City 1908
SHARPLES, ROBERT P., West Chester, Pa. 1907
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash. 1908
SHEARER, AMON R., Mont Belvieu, Tex. 1905
*SHERMAN, Miss ALTHEA R., National, Iowa 1907
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C. 1907
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C. 1910
SHOEMAKER, FRANK H., 206 Nebraska Hall, Station A, Lincoln, Neb. 1895
SHORE, EDWIN W., 191 Campbell St., New Bedford, Mass. 1909
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis. 1899
SHUMWAY, GEORGE, Galesburg, Ill. 1906
SILLIMAN, HARPER, 4 Gramercy Park, New York City 1902
SIMMONS, GEO. F., 701 Holman Ave., Houston, Texas 1910
SINCLAIR, JOHN ABBOTT, New Hampton, N. H. 1909
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill. 1906
SMITH, Miss ETHEL M., 318 Strong Ave., Stevens Point, Wis. 1910
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y. 1903
SMITH, Prof. FRANK, Univ. of Ill., Urbana, Ill. 1909
SMITH, HORACE G., Historical and Nat. Hist. Society, Denver, Colo. 1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C. 1886
SMITH, JESSE L., 141 South 2nd St., Highland Park, Ill. 1907
SMITH, LOUIS IRVIN, Jr., 3809 Chestnut St., Philadelphia, Pa. 1901
SMITH, MYRTON T., 308 Pearl St., Hartford, Conn. 1909
SMITH, PHILO W., JR., Box 285, Eureka Springs, Ark. 1903
SMITH, Mrs. RUTH COOK, Woodcliffe Lake, N. J. 1909
SMITH, WILBUR F., 198 Ely Ave., South Norwalk, Conn. 1909

SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va....1892
SNYDER, WILL EDWIN, R. F. D. 6, Beaver Dam, Wis.....1895
SOULE, Mrs. ETTA RICH, 11 Centre St., Watertown, Mass.....1909
SPAULDING, FRED B., Lancaster, N. H.....1894
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....1883
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....1909
STEBBINS, Miss FANNIE A., 480 Union St., Springfield, Mass.....1903
STEELE, JOHN H., Flemington, N. J.....1906
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....1909
STEVENS, CAROLINE M., 52 Bowdoin St., Portland, Me.....1906
STEVENS, Dr. J. F., Box 546, Lincoln, Neb.....1908
STILES, EDGAR C., 345 Main St., West Haven, Conn.....1907
STONE, CLARENCE F., Branchport, N. Y.....1903
STONE, NATHAN F., Shrewsbury, Mass.....1908
STRATER, Mrs. WM. E., 1114 3d St., Louisville, Ky.....1910
STRATTON-PORTER, Mrs. GENE, Limberlost Cabin, Geneva, Ind.....1906
STRECKER, JOHN KERN, Jr., Baylor Univ., Waco, Texas.....1909
STREET, J. FLETCHER, Beverly, N. J.....1908
STURGIS, S. WARREN, Groton, Mass.....1910
STUART, Miss KATHARINE H., 719 King St., Alexandria, Va.....1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....1896
STYER, Mrs. KATHARINE R., Concordville, Pa.....1903
SUMNER, Mrs. GRAHAM, Englewood, N. J.....1910
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa.....1897
SWAIN, JOHN MERTON, Box 142, Farmington, Me.....1899
SWEET, EDMUND H., Sturgis, S. D.....1910
SWENK, MYRON H., 3028 Starr Street, Lincoln, Neb.....1904
SWEZEY, GEORGE, 855 S. 15th St., Newark, N. J.....1901
TAFT, Miss GRACE ELLIS, 50 W. 93d St., New York City.....1910
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....1907
TAYLOR, THORNE C., Hubbard Woods, Ill.....1908
TERRILL, LEWIS McI., 352 Elm Ave., Westmount, Quebec.....1907
TEST, CHARLES DARWIN, Golden, Col.....1906
TEST, Dr. FREDERICK CLEVELAND, 4620 Greenwood Ave., Chicago, Ill.....1892
TEST, LOUIS AGASSIZ, Rolla, Mo.....1908
THOMAS, Miss EMILY HINDS, 2000 Spruce St., Philadelphia, Pa.....1901
THOMPSON, CHAS. S., Box 207, Burbank, Cal.....1909
THOMPSON, ROY, University, N. D.....1905
THORNE, SAMUEL, 914 5th Ave., New York City.....1908
TILLEY, GEO. D., Darien, Conn.....1910
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....1907
TOPPAN, GEORGE L., 672 Graceland Ave., Chicago, Ill.....1886
TOWER, Mrs. KATE DENIG, Hotel Bristol, Boston, Mass.....1908
TOWNSEND, WILMOT, 272 75th St., Brooklyn, N. Y.....1894
TREGANZA, A. O., 610 Utah Saving's & Trust Bldg., Salt Lake City, Utah.....1906

TRIPPE, THOMAS M., Howardsville, Colo.....1909
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....1899
TRUMBULL, J. H., Plainville, Conn.....1907
TUBBS, Prof. FRANK Dean, 129 Wood St., Lewiston, Me.....1909
TUDBURY, WARREN C., 33 Main St., Attica, N. Y.....1903
TUFTS, LE ROY MELVILLE, Thrushwood, Farmington, Me.....1903
TUFTS, Miss MARY I., 163 Lewis St., Lynn, Mass.....1910
TUTTLE, Dr. ALBERT H., 1069 Boylston St., Boston, Mass.....1908
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....1890
TUTTLE, HENRY EMERSON, 242 York St., New Haven, Conn.....1909
TWEEDY, EDGAR, 13 Fairview Ave., Danbury, Conn.....1902
ULRICH, ALBERT GEORGE, 3307 Washington Ave., St. Louis, Mo.....1909
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....1900
UPHAM, Mrs. WILLIAM H., 212 3rd Ave., Marshfield, Wis.....1907
VALENTINE, Miss ANNA J., Bellefonte, Pa.....1905
VALENTINE, Miss LUCY W., 2 Trowbridge Terrace, Cambridge, Mass.1908
VAN BEUREN, Miss LOUISE, 21 W. 14th St., New York City.....1909
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....1885
VAN NAME, WILLARD GIBBS, N. Y. State Museum, Albany, N. Y....1900
VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....1907
VARICK, Mrs. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.1900
VETTER, Dr. CHARLES, 50 Central Park West, New York City.....1898
VISHER, STEPHEN S., Vermilion, S. D.....1904
VON LENGERKE, JUSTUS, 200 Fifth Ave., New York City.....1907
VON ROSSEM, ADRIAN, 223 N. Orange Grove, Pasadena, Cal.....1908
VROOMAN, ISAAC H., Jr., 282 Hamilton St., Albany, N. Y.....1908
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn...1906
WALES, EDWARD H., Hyde Park, N. Y.....1896
WALES, Miss ELLA, 186 Columbia Road, Dorchester, Mass.....1908
WALKER, CURTIS H., University of Chicago, Chicago, Ill.....1910
WALKER, GEO. R., R. F. D. 3, Murray, Utah.....1909
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....1888
WALLACE, Dr. A. H., 204 Bellevue Ave., Upper Montclair, N. J.....1907
WALLACE, JAMES S., 69 Front St., Toronto, Ontario.....1907
WALTER, HERBERT E., Dr., 53 Arlington Ave., Providence, R. I.....1901
WALTERS, FRANK, South Sandisfield, Mass.....1902
WARD, FRANK HAWLEY, 12 Grove Place, Rochester, N. Y.....1908
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....1906
WARD, Mrs. MARTHA E., 25 Arlington St., Lynn, Mass.....1909
WARNER, EDWARD P., Concord, Mass.....1910
WARNER, GOODWIN, 920 Center St., Jamaica Plain, Mass.....1908
WEBER, J. A., Box 216, Palisades Park, N. J.....1907
WEIR, J. ALDEN, 471 Park Ave., New York City.....1899
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.....1908

WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J. 1902
WENTWORTH, IRVING H., San Carlos, Tamaulipas, Mexico 1900
WETMORE, ALEXANDER, care of Museum, Lawrence, Kansas 1908
WETMORE, Mrs. EDMUND, 343 Lexington Ave., New York City 1902
WEYGANDT, CORNELIUS, Wissahickon Ave., Mt. Airy, Philadelphia, Pa. 1907
WHARTON, WILLIAM P., Groton, Mass. 1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn. ... 1898
WHEELER, JOHN B., East Templeton, Mass. 1897
WHEELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill. 1902
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H. 1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario 1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y. 1902
WHITEHEAD, ELY L., 712 Michigan Ave., Evanston, Ill. 1908
WICKERSHAM, CORNELIUS W., 43 Exchange Place, New York City .. 1902
WIKEL, HENRY H., Manual Training High School, Brooklyn, N. Y. .. 1909
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y. 1895
WILCOX, Miss ALICE W., 165 Prospect St., Providence, R. I. 1908
WILCOX, Dr. EMMA D., 307 W. 98th St., New York City 1905
WILCOX, T. FERDINAND, 115 W. 75th St., New York City 1895
WILDE, MARK L. C., 311 N. 5th St., Camden, N. J. 1893
WILLARD, BERTEL G., Box 107, Millis, Mass. 1906
WILLARD, FRANK C., Tombstone, Arizona 1909
WILLETT, VICTOR JOHN AUSTIN, Wydecombe, Whiteman's Creek, B. C. 1909
WILLIAMS, HARRY C., 5344 Cabanne Ave., St. Louis, Mo. 1908
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City 1888
WILLIAMS, ROBERT W., Jr., U. S. Dept. Agriculture, office of the Solicitor, Washington, D. C. 1900
WILLIAMSON, E. B., Bluffton, Ind. 1900
WILSON, SIDNEY S., German American Bank Bldg., St. Joseph, Mo. .. 1895
WINDLE, FRANCIS, 253 Dean St., West Chester, Pa. 1909
WISE, Miss HELEN D., 1514 13th St., N. W., Washington, D. C. 1910
WISTER, WILLIAM ROTCH, 505 Chestnut St., Philadelphia, Pa. 1904
WITHERBEE, Mrs. F. B., 106 Berkeley St., West Newton, Mass. 1906
WOOD, Mrs. GEO., 1313 Spruce St., Philadelphia, Pa. 1910
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich. 1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C. 1895
WOOD, NORMAN A., University of Michigan, Ann Arbor, Mich. 1904
WOODCOCK, ARTHUR ROY, Corvallis, Ore. 1901
WOODRUFF, FRANK M., 225 Wisconsin St., Chicago, Ill. 1904
WOODRUFF, LEWIS B., 24 Broad St., New York City 1886
WORCESTER, Mrs. ALFRED, Bacon St., Waltham, Mass. 1908
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y. 1889
WRIGHT, ALBERT H., 115 Stewart Ave., Ithaca, N. Y. 1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich. 1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass. 1902

WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal....1907
WRIGHT, SAMUEL, Conshohocken, Pa.....1895
WYMAN, LUTHER E., R. R. No. 3, Nampa, Idaho.....1907
YOUNG, JOHN A., Calder Villa, Bridge of Allan, Scotland.....1907
ZAPPEY, WALTER R., 25 Rindgefield St., North Cambridge, Mass...1905
ZIMMER, J. T., 42d and Holdridge Sts., Lincoln, Neb.....1908

DECEASED MEMBERS.

FELLOWS.

	Date of Death
ALDRICH, CHARLES	March 8, 1908
BAIRD, SPENCER FULLERTON	Aug. 19, 1887
BENDIRE CHARLES EMIL	Feb. 4, 1897
COUES, ELLIOTT	Dec. 25, 1899
GOSS, NATHANIEL STICKNEY	March 10, 1891
HOLDER, JOSEPH BASSETT	Feb. 28, 1888
JEFFRIES, JOHN AMORY	March 26, 1892
MCILWRAITH, THOMAS	Jan. 31, 1903
MERRILL, JAMES CUSHING	Oct. 27, 1902
SENNETT, GEORGE BURRITT	March 18, 1900
TRUMBULL, GURDON	Dec. 28, 1903
WHEATON, JOHN MAYNARD	Jan. 28, 1887

HONORARY MEMBERS.

BLANFORD, WILLIAM THOMAS	June 23, 1905
BOCAGE, J. V. BARBOZA DU	July, 1908
BURMEISTER, HERMANN	May 1, 1892
CABANIS, JEAN	Feb. 20, 1909
GÄTKE, HEINRICH	Jan. 1, 1897
GIGLIOLI, HENRY HILLYER	Dec. 14, 1909
GUNDLACH, JUAN	March 14, 1809
GURNEY, JOHN HENRY	April 20, 1896
HARTLAUB, GUSTAV	Nov. 20, 1900
HUXLEY, THOMAS HENRY	June 29, 1890
KRAUS, FERDINAND	Sept. 15, 1895
LAWRENCE, GEORGE NEWBOLD	Jan. 17, 1895
MILNE-EDWARDS, ALPHONSE	April 21, 1900
NEWTON, ALFRED	June 7, 1907
PARKER, WILLIAM KITCHEN	July 3, 1890
PELZELN, AUGUST VON	Sept. 2, 1891
SALVIN, OSBERT	June 1, 1898
SAUNDERS, HOWARD	Oct. 20, 1907

SCHEGEL, HERMANN.....Jan. 17, 1884
SEEBOHM, HENRY.....Nov. 26, 1895
SHARPE, RICHARD BOWDLER.....Dec. 25, 1909
TACZANOWSKI, LADISLAS.....Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.....Jan. 1, 1900
ANDERSON, JOHN.....Aug. 16, 1900
BALDAMUS, EDUARD.....Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT.....Oct. 15, 1891
BLASIUS, RUDOLPH.....Sept. 21, 1907
BOGDANOW, MODEST NIKOLAEVICH.....March 4, 1888
BRYANT, WALTER, E.....May 21, 1905
BULLER, WALTER LAWRY.....July 19, 1906
COOPER, JAMES GRAHAM.....July 19, 1902
CORDEAUX, JOHN.....Aug. 1, 1899
DAVID, ARMAND.....Nov. 10, 1900
FATIO, VICTOR.....March 19, 1909
HAAST, JULIUS VON.....Aug. 15, 1887
HARGITT, EDWARD.....March 19, 1895
HOLUB, EMIL.....Feb. 21, 1902
HOMEYER, EUGEN FERDINAND VON.....May 31, 1889
LAYARD, EDGAR LEOPOLD.....Jan. 1, 1900
LEVERKÜHN, PAUL.....Dec. 5, 1905
LYTTLETON, THOMAS LORD LILFORD.....June 17, 1896
MARSCHALL, AUGUST FRIEDRICH.....Oct. 11, 1887
MALMGREN, ANDERS JOHAN.....April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON.....Jan. 28, 1894
MOSJISOVICS, FELIX G. HERMANN AUGUST.....Aug. 27, 1897
OUSTALET, EMILE.....Oct. 23, 1905
PHILIPPI, R. A.....Aug. —, 1904
PREJEVALSKI, NICOLAS MICHAELOVICH.....Oct. 20, 1887
PRENTISS, DANIEL WEBSTER.....Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....Feb. 17, 1888
RADDE, GUSTAV FERDINAND.....—— 1903
SCHRENCK, LEOPOLD VON.....Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE.....Dec. 11, 1900
SEVERTZNOW, NICOLAI ALEKSEWICH.....Feb. 8, 1885
SHELLEY, GEORGE ERNEST.....Nov. 29, 1910
STEVENSON, HENRY.....Aug. 18, 1888
TRISTRAM, H. B.....March 8, 1906
WHARTON, HENRY T.....Sept. —, 1895
WOODHOUSE, SAMUEL W.....Oct. 23, 1904

Members.

Fannin, John ..... June 20, 1904
Hardy, Manly ..... Dec. 9, 1910
Judd, Sylvester Dwight ..... Oct. 22, 1905
Ralph, William LeGrange ..... July 8, 1907
Whitman, Charles Otis ..... Dec. 6, 1910

Associates.

Adams, Charles F. ..... May 20, 1893
Allen, Charles Slover ..... Oct. 15, 1893
Antes, Frank T. ..... Feb. 6, 1907
Atkins, Harmon Albro ..... May 19, 1885
Avery, William Cushman ..... March 11, 1894
Bailey, Charles E. ..... ——, 1905
Barlow, Chester ..... Nov. 6, 1902
Baur, George ..... June 25, 1898
Beckham, Charles Wickliffe ..... June 8, 1888
Bill, Charles ..... April —, 1897
Birtwell, Francis Joseph ..... June 29, 1901
Boardman, George Augustus ..... Jan. 11, 1901
Bolles, Frank ..... Jan. 10, 1894
Brackett, Foster H. ..... Jan. 5, 1900
Breese, William Lawrence ..... Dec. 7, 1889
Breninger, George Frank ..... Dec. 3, 1905
Brennan, Charles F. ..... Mar. 21, 1907
Brokaw, Louis W. ..... Sept. 3, 1897
Brown, John Clifford ..... Jan. 16, 1901
Browne, Francis Charles ..... Jan. 9, 1900
Brownson, W. H. ..... Sept. 6, 1909
Burnett, Leonard E. ..... March 16, 1904
Cairns, John S. ..... June 10, 1895
Call, Aubrey Brendon ..... Nov. 20, 1901
Campbell, Robert Argyll ..... April —, 1897
Canfield, J. B. ..... Feb. 18, 1904
Carleton, Cyrus ..... Nov. 15, 1907
Carter, Edwin ..... —— 1900
Carter, Isabel Paddock ..... Sept. 15, 1907
Chadbourne, Mrs. Arthur Patterson ..... Oct. 4, 1908
Clark, John Nathaniel ..... Jan. 13, 1903
Coe, W. W. ..... April 26, 1885
Colburn, William W. ..... Oct. 17, 1899
Collett, Alonso M. ..... Aug. 22, 1902

Conant, Mrs. Thos. O.	Dec. 28, 1907
Corning, Erastus, Jr.	April 9, 1893
Daffin, Wm. H.	April 21, 1902
Dakin, John Allen	Feb. 21, 1900
Davis, Walter R.	April 8, 1907
Dexter, Newton	July 27, 1901
Dodge, Julian Montgomery	Nov. 23, 1909
Elliott, Samuel Lowell	Feb. 11, 1889
Fairbanks, Franklin	April 24, 1895
Ferry, John Farwell	Feb. 11, 1910
Fisher Wm. Hubbell	Oct. 6, 1909
Fowler, Joshua Lounsbury	July 11, 1899
Fuller, Charles Anthony	Mar. 16, 1906
Gesner, Abraham Herbert	April 30, 1895
Goss, Benjamin Franklin	July 6, 1893
Hatch, Jesse Maurice	May 1, 1898
Hoadley, Frederick Hodges	Feb. 26, 1895
Holmes, LaRue Klingle	May 10, 1906
Hoopes, Josiah	Jan. 16, 1904
Howland, John Snowdon	Sept. 19, 1885
Ingersoll, Joseph Carleton	Oct. 2, 1898
Jenks, John Whipple Potter	Sept. 27, 1894
Jesurun, Mortimer	March —, 1905
Jouy, Pierre Louis	March 22, 1894
Kelker, Wm. A.	Feb. 15, 1908
Knight, Wilbur Clinton	July 8, 1903
Knox, John C.	July 9, 1904
Knox, John Cowing	June 1, 1904
Koch, August	Feb. 15, 1907
Kumlien, Ludwig	Dec. 4, 1902
Kumlien, Thure	Aug. 5, 1888
Lawrence, Robert Hoe	April 27, 1897
Lee, Leslie Alexander	May 20, 1908
Linden, Charles	Feb. 3, 1888
Lloyd, Andrew James	June 14, 1906
Mabbett, Gideon	Aug. 15, 1900
Maitland, Alexander	Oct. 25, 1907
Marble, Charles C.	Sept. 25, 1900
Marcy, Oliver	March 19, 1899
Maris, Willard Lorraine	Dec. 11, 1895
McEwen, Daniel C.	Nov. 1, 1909
McKinlay, James	Nov. 1, 1899
Mead, George Smith	June 19, 1901
Minot, Henry Davis	Nov. 13, 1890
Morrell, Clarence Henry	July 15, 1902
Nichols, Howard Gardner	June 23, 1896

NIMS, LEE ..... March 12, 1903
NORTHROP, JOHN I ..... June 26, 1891
PADDOCK, ISABEL M ..... Sept. 15, 1907
PARK, AUSTIN F ..... Sept. 22, 1893
PAULMIER, FREDERICK CLARK ..... March 3, 1906
POMROY, GRACE V ..... May 14, 1906
RAGSDALE, GEORGE HENRY ..... March 25, 1895
READY, GEORGE H ..... March 20, 1903
RICHARDSON, JENNESS ..... June 24, 1893
ROBINS, MRS. EDWARD ..... July 2, 1906
SAND, ISABELLA LOW ..... April 20, 1906
SELOUS, PERCY SHERBORN ..... April 7, 1900
SLATER, JAMES H ..... Feb. —, 1895
SLEVIN, THOMAS EDWARDS ..... Dec. 23, 1902
SMALL, EDGAR ALBERT ..... April 24, 1884
SMITH, CLARENCE ALBERT ..... May 6, 1896
SNOW, FRANCIS HUNTINGTON ..... Sept. 20, 1908
SOUTHWICK, JAMES MORTIMER ..... June 3, 1904
STOWE, W. H ..... March —, 1895
SWEIGER, MRS. J. L ..... March 23, 1907
TAYLOR, ALEX. O'DRISCOLL ..... April 10, 1910
THOMPSON, MILLET T ..... Aug. 7, 1907
THORNE, PLATTE MARVIN ..... March 16, 1897
THURBER, EUGENE CARLETON ..... Sept. 6, 1896
VENNOR, HENRY GEORGE ..... June 8, 1884
WATERS, EDWARD STANLEY ..... Dec. 26, 1902
WILLARD, SAMUEL WELLS ..... May 24, 1887
WOOD, WILLIAM ..... Aug. 9, 1885
WOODRUFF, EDWARD SEYMOUR ..... Jan. 15, 1909
WORTHEN, CHARLES K ..... May 27, 1909
YOUNG, CURTIS CLAY ..... July 30, 1902

ICTERUS FUERTESI CHAPMAN
ADULT MALE AND FEMALE
(Two-thirds natural size)

THE AUK:

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DESCRIPTION OF A NEW ORIOLE (*ICTERUS FUERTESI*) FROM MEXICO.

BY FRANK M. CHAPMAN.

Plate I.

AMONG the birds collected by Louis Agassiz Fuertes and the writer in Mexico, between February 23 and April 21, 1910, are four specimens of an apparently undescribed oriole which, while most nearly related to *Icterus spurius*, appears to be specifically distinct from that bird. For this new bird I propose the name *Icterus fuertesi*, in honor of Louis Agassiz Fuertes, not alone in recognition of his invaluable services to ornithology, but also because, attracted by its notes, he was the actual discoverer of the species to which his name is now given.

This interesting species was found on the south bank of the Tamesi River, Mexico, some 75 miles by river and 35 miles in an air-line from Tampico, where from April 1–9, we were the guests of Mr. Thomas H. Silsbee on the sugar plantation Paso del Haba. The Tamesi River at this point is 100 yards wide. Its banks are high and, except where cleared, support narrow strips of heavy forest which, a short distance inland, is flanked by the lower, more scrubby growth characteristic of the region.

The orioles in question inhabited the dense bushy growth which has sprung up on the river banks from which the forest has been cut. They were all taken in a space not more than two hundred

yards long and, in addition to the four specimens secured, at least one more adult male was seen.

Whether the birds also occurred in favorable areas beyond the heavy forest I am unable to say, since the surprising abundance of bird-life near the river claimed all our time and attention.

In the same bit of second growth from which the four specimens of *Icterus fuertesi* were taken I collected a perfectly typical adult male *Icterus spurius*, a circumstance which suggests the possibility of the two male specimens of the proposed new bird being aberrant examples of that species. Opposed to this theory, however, are the following facts: (1) The two adult males secured are essentially alike, the third, which was well seen, was of the same buffy color, while examination of very large series of adult *Icterus spurius* reveals no specimen approaching those representing the proposed new species. (2) The four specimens of *Icterus fuertesi* are all smaller than any specimens of *Icterus spurius* which I have examined, as the appended table of southern breeding birds shows, while the Tamesi specimen of *Icterus spurius* (as well as an adult male taken by Mr. Fuertes in the Tamiahua Lagoon, April 17, 1910) agrees in size with specimens of *Icterus spurius* from Texas. (3) The four specimens of *Icterus fuertesi* had the sexual organs much enlarged and were evidently about to breed, while in the specimens of *Icterus spurius* the sexual organs were but slightly increased in size. In short, it is believed that the specimen of *Icterus spurius*, taken with *Icterus fuertesi* on April 5, was a northbound migrant, a belief supported by observations made in the spring of 1891 at Corpus Christi, Texas, where *Icterus spurius* was first noted as arriving from the south on April 5.

It may be added that the song of *Icterus fuertesi*, while unmistakably of the Orchard Oriole type, differs materially from the song of that species. It is less rich and loud, and lacks a certain distinctness of articulation and finish which characterize the song of *Icterus spurius*.

The type of *Icterus affinis* Lawr. (Am. Mus. No. 41954) has the chestnut-colored areas of rather exceptional richness and depth. It was taken at Brownsville, Texas, by J. P. McCown, evidently in the spring, although the label lacks date. Its small size, however, would indicate that it was a breeding bird, and we have

Merrill's statement (Proc. U. S. Nat. Mus., 1878, p. 135) to the effect that this species nests "rather plentifully" at that point. In view of the fact that breeding specimens from southern Texas and from Mexico in the American Museum collection (see table beyond) while smaller, as might be expected, show no appreciable difference in color from specimens of *Icterus spurius* at the northern limit of its range, it is not a little surprising that within a distance of 250 miles, and with no very striking change in environment, a difference as great as that exhibited by *Icterus fuertesi* should be shown. While the new bird, therefore, appears unquestionably to be a representative of *Icterus spurius*, it probably does not intergrade with that form, and I have no hesitation in describing it as a distinct species.

Icterus fuertesi sp. nov.

FUERTES'S ORIOLE.

Chars. Sp.— Most nearly related to *Icterus spurius*, but smaller with the chestnut areas of that species replaced by a color which varies from buff to ochraceous. Type, Coll. Am. Mus. Nat. Hist., 95909; Paso del Haba, south shore of Tamesi River, 35 miles northwest of Tampico, Mexico, April 6, 1910; collected and presented by Louis Agassiz Fuertes.

Description of Adult Male (type).— Head, throat, center of chest, foreback and scapulars black, the two latter slightly edged with grayish brown; rest of body, including upper and under tail-coverts, rich buff with a slight yellowish cast, particularly medianly on the underparts (the color here is much like the buffy tips to the fall plumage of adult males of *Icterus spurius*), and with a cinnamon shade on the rump; wings black, edged externally with whitish, lesser, median, and under wing-coverts cinnamon-buff, greater wing-coverts black, bordered terminally with white; tail black, the outer feathers graduated and narrowly tipped with whitish. Wing, 71; tail, 64; exposed culmen, 15 mm.

Adult Female.— Similar in color to the corresponding plumage of *Icterus spurius* but size smaller. Wing, 68; tail, 63.5; exposed culmen, 14.5 mm. (No. 95908, Tamesi River, Mexico, April 7, 1910, F. M. C.)

Immature Male.— Similar in color to corresponding plumage of *Icterus spurius*, but smaller. Wing, 72; tail, 65.5; exposed culmen, 15 mm. (No. 95907, Tamesi River, April 7, 1910, F. M. C.)

TABLES OF MEASUREMENTS.

Icterus fuertesi.

Coll.	Sex.	Date and Place.	Wing.	Tail.	Ex. Culmen.
			mm.	mm.	mm.
Am. Mus. 95909 (type)	♂ ad.	Tamesi River, Mex. Apr. 6	71	64	15
L. A. F. 2201	♂ ad.	" " Apr. 6	72.5	66.5	16
Am. Mus. 95907	♂ im.	" " Apr. 7	72	65.5	15.
Am. Mus. 95908	♀ ad.	" " Apr. 7	68	63.5	14.5

Icterus spurius.

Coll.	Sex.	Date and Place.	Wing.	Tail.	Ex. Culmen.
			mm.	mm.	mm.
Am. Mus., aver. 5 ads.	♂ ad.	Vicinity New York City, May	81.5	74.5	16.5
" " 82901	♂ ad.	Hidalgo, Tex., May 24	78.	68.	—
" " 82885	♂ ad.	Rio Grande City, June 23	74.5	68.	16.
" " 82891	♂ ad.	Lomita, Tex., July 12	79.5	70.	16.5
" " 82890	♂ ad.	" " July 12	79.	70.	16.
" " 87944	♂ ad.	Escuinapa, Sinaloa, Mex. July 29	77.	68.	—
" " 87943	♂ ad.	Rosario, Sinaloa, Mex., July 22	77.	70.	15.
" " 95906	♂ ad.	Tamesi River, Mex., April 6	77.	71.	15.5
" " 75322	♀ ad.	Hastings, N. Y., May 15	75.	65.5	15.5
" " 82892	♀ ad.	Lomita, Tex., July 4	69.	64.5	15.

ANNOTATED LIST OF THE BIRDS OF HARDING COUNTY, NORTHWESTERN SOUTH DAKOTA.[1]

BY STEPHEN SARGENT VISHER.

THE following list is based upon three sources of information: (1) Mr. G. B. Grinnell passed through the area from northeast to southwest during July 9–16, 1874, and through the western part August 17–20 with the Custer Expedition to the Black Hills. His report as naturalist, published in Ludlow's 'Report of Reconnaissance of the Black Hills,' contains some statements which certainly apply to our district. (2) Mr. Sal Catron of Camp Crook has lived there on the Little Missouri River since 1883. Continual hunting has made him familiar with the larger birds. (3) As naturalist to the South Dakota Geological and Natural History Survey, it was my privilege to spend practically two months (July 7–September 4) of the summer of 1910 in this area. Of the seventy-odd townships of the county, all but a half dozen of the least interesting were studied. Time did not suffice for the making of a comprehensive collection of the birds, but those of doubtful identity were, as far as practicable, as well as certain others, collected and preserved for the State museum.

Harding County is situated in the extreme northwestern corner of South Dakota. Its north boundary is North Dakota, and its western, Montana. It extends southward almost to the Montana-Wyoming corner. East by west the length is fifty-four miles; its width is fifty-one miles. The range in altitude is about seven hundred feet, from about 3,000 feet to about 3,700 feet. Physiographically the most of the area is a high divide between the Little Missouri River drainage and that east by the Moreau and Grand Rivers to the Missouri. This divide is studded with several groups of flat-topped elevations called buttes or hills which rise about 400 feet above their bases, often with sheer cliffs for most of the height. The forested ones, and hence those of especial interest, are: (1) North and South Cave Hills, which lie in the north central

[1] Published by the permission of the State Geologist.

part of the county. The Cave Hills Forest Reserve covers over 23,000 acres. (2) Slim Buttes. This much dissected ridge extends for about twenty-five miles from almost the south line northward, and within a few miles of the eastern edge of the county. The Slim Buttes Reserve covers about 58,000 acres. (3) The East and West Short Pine Hills (Forest Reserve covers 23,000 acres) lie in the southwestern portion of the county. (4) The Long Pine Hills are west of the Little Missouri River and mostly in Montana, but differ from the Short Pines only in being larger and more heavily forested.

The large streams of the area are: (1) The Little Missouri River which flows northward into North Dakota almost across the county and near its western border. It is ordinarily but a small, shallow and swift stream. (2) The North Fork of the Grand River, along the north edge of the area. The South Fork drains most of the county. It flows eastward from near the center of the region. (3) The North Fork of the Moreau River flows east from the Short Pine Hills. The only other flowing streams are one or two short brooks in each of the forested buttes. The larger creeks have permanent water holes. After heavy rains, pools, usually but a few inches deep, are formed in blow-outs on the plains. The year 1910, until August 15, was unusually dry.

The vegetal covering of most of the area is that of a steppe, low 'buffalo' grasses and scattered perennials and annuals. On the 'tables' of the buttes and along the flood plains of the streams a ranker growth of grass is found. Along the streams are groves or individual trees of cottonwood, box-elder, willow or ash, or thickets of buffalo-berry, etc. The largest groves are in the Little Missouri Valley near Camp Crook, which is in the central western part of the county. Trees are almost lacking along the Grand and Moreau Rivers. The cañons of the higher buttes are more or less filled with groves of the deciduous trees mentioned above and thickets of plum, hawthorn, choke-cherry, etc. The slopes of the high buttes are largely covered with western yellow pine (*Pinus ponderosa scopulorum*). The terraces of the streams, especially in the western part of the county, are covered with sage-brush. The local badlands present thickets of cedar and patches of juniper as well as sage-brush and grease-wood.

The southern half of the county is over sixty miles from a railroad.

Ecologically the nesting birds may be grouped into five or more distinct associations; those of the steppe of the deciduous woods along the streams, of the pine forests, of badlands, and those of bodies of water.

1. The conspicuous nesting birds of the steppe or plains are Upland Plover, Long-billed Curlew, Marsh, Swainson and Sparrow Hawks, Burrowing Owl, Western Nighthawk, Desert Horned Lark, Western Meadowlark, Brewer's Blackbird, Chestnut-collared and McCown's Longspurs, Western Vesper Sparrow, Lark Bunting and Sprague's Pipit.

2. The most numerous birds of the groves of deciduous trees are: Mourning Dove, Downy and Red-headed Woodpeckers, Northern and Red-shafted Flickers, Kingbird, Traill's Flycatcher, Magpie, Crossbill, Goldfinch, Western Lark Sparrow, Arctic Towhee, Black-headed Grosbeak, White-rumped Shrike, Yellow Warbler, Long-tailed Chat, Brown Thrasher, and Robin.

3. In the pine woods are to be found Hairy Woodpecker, Clarke's Nutcracker, Piñon Jay, White-winged Junco, Arctic Towhee, Cedar Waxwing, Audubon's Warbler, Ovenbird, Western House Wren, Red-bellied Nuthatch, Long-tailed Chickadee and Western Bluebird.

4. In badlands, Prairie Falcon, Western Horned Owl, Say's Phœbe, Cliff Swallow and Rock Wren are almost certain to breed.

5. About water, the following were frequently found in midsummer: Blue and Green-winged Teals, Shoveller, Pintail, Spotted and Solitary Sandpipers, Killdeer, Kingfisher, Brewer's Blackbird.

Harding County presents more variety than surrounding counties do, and it is probable that a complete list of its birds would include practically all of those of the southwestern fourth of North Dakota, southeastern Montana, and even northeastern Wyoming.

List of Species

1. **Colymbus nigricollis californicus**. EARED GREBE.— An occasional migrant along the Little Missouri River.

2. **Podilymbus podiceps.** PIED-BILLED GREBE.— Reported by Catron and others to be a fairly abundant migrant along the larger streams.

3. **Gavia immer.** LOON.— Mr. Catron has shot a loon on two occasions, flying along the Little Missouri.

4. **Larus delawarensis.** RING-BILLED GULL.— Taken by Grinnell on the Little Missouri River in July.

5. **Sterna forsteri.** FORSTER'S TERN.*[1] — A flock of terns, probably of this species, was seen hovering over the Little Missouri River August 30.

6. **Hydrochelidon nigra surinamensis.** BLACK TERN.— A fairly common migrant through the county.

7. **Mergus americanus.** AMERICAN MERGANSER.— Taken, infrequently, by Catron.

8. **Merganser serrator.** RED-BREASTED MERGANSER.* — Mr. Catron reports having several times shot them on the Little Missouri River near Camp Crook during migrations. Taken by Grinnell near our area.

9. **Lophodytes cucullatus.** HOODED MERGANSER.— Occasional migrant (Catron). Grinnell found them nesting near our area.

10. **Anas platyrhynchos.** MALLARD.— Abundant migrant, arriving August 22. Reported by Grinnell, Catron, and others to nest during wet summers.

11. **Mareca americana.** BALD-PATE.— A common migrant (Catron). Grinnell reports that in 1874 they bred near our area.

12. **Nettion carolinensis.** GREEN-WINGED TEAL.— Breeds wherever possible. Six broods seen, one on an artificial pond not larger than two rods square.

13. **Querquedula discors.** BLUE-WINGED TEAL.— As abundant as the preceding.

14. **Spatula clypeata.** SHOVELLER.— Common migrant. One brood of young seen on an artificial pond.

15. **Dafila acuta.** PINTAIL.— Abundant breeder on artificial ponds and along Grand River.

16. **Marila americana.** RED-HEAD.* — Usually fairly abundant during migrations (Catron).

17. **Marila vallisineria.** CANVAS-BACK.— Uncommon, during migrations (Catron).

18. **Marila marila.** GREATER SCAUP DUCK.* — Abundant migrant along the rivers (Catron).

19. **Marila affinis.** LESSER SCAUP DUCK.— Very common migrant (Catron).

20. **Charitonetta albeola.** BUFFLE-HEAD.— Abundant migrant.

21. **Chen hyperborea** (subsp.). SNOW GOOSE.— Not commonly seen, most frequently in spring (Catron and others).

22. **Anser albifrons gambeli.** WHITE-FRONTED GOOSE.* — Catron reports this to be the most abundant goose; a common migrant.

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[1] An asterisk indicates that the species is not mentioned in the author's list of birds of Western South Dakota, published in 'The Auk,' April, 1909, pp. 144–153.

23. **Branta canadensis.** CANADA GOOSE.— Grinnell found this species breeding abundantly along the Little Missouri and other streams in 1874. Catron reports they were fairly common till 1890. Now infrequent and seen only as a migrant.

24. **Branta hutchinsi.** HUTCHINS'S GOOSE.— Not common during migrations (Catron and others).

25. **Botaurus lentiginosus.** BITTERN.— A few here last year (1909), which was a wet season.

26. **Ardea herodias.** GREAT BLUE HERON.— Both Grinnell and Catron reported that this species occasionally breeds along the Little Missouri River.

27. **Butorides virescens.** GREEN HERON.— One seen July 13.

28. **Nycticorax nycticorax nævius.** BLACK-CROWNED NIGHT HERON.* — Several young of this year were seen on the Moreau River during the third week of August.

29. **Grus americana.** WHOOPING CRANE.* — Reported to be not infrequently seen during the spring migration.

30. **Grus canadensis.** LITTLE BROWN CRANE.[1] — Grinnell states that this species was occasionally seen on the plains, and that its nests were numerous in the pines of the Black Hills. Its present status may be described as "occasionally an abundant migrant."

31. **Rallus virginianus.** VIRGINIA RAIL.— One pair bred in a small reedy patch in the Cave Hills.

32. **Fulica americana.** COOT.— Rare, because of almost total absence of suitable resorts.

33. **Recurvirostra americana.** AVOCET.— Fairly abundant in migrations (Catron). Ten were seen flying low on August 23.

34. **Micropalama himantopus.** STILT SANDPIPER.— Seen on the South Fork of the Grand River August 17. Apparently only a migrant.

35. **Gallinago delicata.** WILSON'S SNIPE.— Common along the river early in September.

36. **Pisobia maculata.** PECTORAL SANDPIPER.— A common migrant.

37. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Several were seen on artificial ponds.

38. **Pisobia minutilla.** LEAST SANDPIPER.— Tolerably common in August.

39. **Totanus melanoleucus.** GREATER YELLOW-LEGS.* — A pair was seen July 19 on Little Missouri River. Catron reports that they are regular and not rare migrants.

40. **Totanus flavipes.** YELLOW-LEGS.— One seen with the preceding. Apparently only a migrant, in dry seasons at least.

41. **Helodromas solitarius.** SOLITARY SANDPIPER.— Rare breeder; abundant migrant. Found wherever there is water, in the buttes as well as on the plains.

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[1] Omitted by error from previous list.

42. **Bartramia longicauda.** UPLAND PLOVER.— Breeds sparingly in the drier western half, mainly in draws of foot-hills, but fairly abundantly in the eastern half.

43. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.* — Seen several times on the shallow pools in blow-outs after the heavy rain of August 15.

44. **Actitis macularia.** SPOTTED SANDPIPER.— Breeds sparingly. A common migrant. Seen after July 15 about almost every body of water.

45 **Numenius longirostris.** LONG-BILLED CURLEW.— Breeds. Frequently seen in the sparsely settled western part of the county. No longer found elsewhere.

46. **Oxyechus vociferus.** KILLDEER.— Very abundant breeder on the plains wherever moist ground occurs. Fledgelings observed as late as August 5.

47. **Ægialitis meloda.** PIPING PLOVER.* — One seen and heard on Boxelder Creek, July 17–18.

48. **Tympanuchus americanus.** PRAIRIE CHICKEN.— Fairly abundant resident in the valleys near the Short Pine Hills. Feeds almost solely on 'buffalo-berries' during their season, August and September.

49. **Bonasa umbellus umbelloides.** GRAY RUFFED GROUSE.— One seen in the Short Pine Hills. Fairly abundant in the Long Pine Hills.

50. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Very abundant resident along the permanent streams and in the park-like area at the top of the buttes and near their base. Broods this year contained about twelve. One nest was found in a clump of 'buck-bush' (*Symphoricarpus*). It was only a slight hollow. The stomach of a bird of the year, shot August 14 on the mesa of the South Cave Hills, contained 200 flying ants, 4 small (shorthorned) grasshoppers, 1 small beetle (Chrysomelidæ), 1 small caterpillar, 25 black currants, 50 pods of wild flax.

51. **Centrocercus urophasianus.** SAGE HEN.— Abundant resident in the areas covered with the scrub sage-bush (*Artemisia tridentata*), where water is not far distant; therefore mainly found on the terraces in the stream valleys. Eight live tapeworms, the largest a foot long, were taken from the body cavity of an adult female which, though in good health, was solitary.

52. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Though a common breeder in the groves along the streams it is but rarely seen in driving about the country.

53. **Carthartes aura septentrionalis.** TURKEY VULTURE.— Tolerably abundant summer resident about the higher buttes. Especially abundant about Slim Buttes, where thirty or forty were found roosting together in a large pine tree during the last week of August.

54. **Circus hudsonius.** MARSH HAWK.— A common summer resident on the plains.

55. **Astur atricapillus.** GOSHAWK.— One seen in the Cave Hills, August 12.

56. **Accipiter velox.** SHARP-SHINNED HAWK.— Common during the autumn migration, which commenced August 22.

57. **Accipiter cooperi.** COOPER'S HAWK.— Several seen early in September along the Little Missouri Valley.

58. **Buteo borealis calurus.** WESTERN RED-TAIL.— A common summer resident throughout the area.

59. **Buteo borealis krideri.** KRIDER'S HAWK.— Two were observed, apparently near their nest, at the cliff of the Cave Hills.

60. **Buteo swainsoni.** SWAINSON'S HAWK.— Abundant summer resident.

61. **Archibuteo lagopus sancti-johannis.** ROUGH-LEGGED HAWK. Seen July 14, and three or four times during the last of August and the first of September.

62. **Archibuteo ferrugineus.** FERRUGINOUS ROUGH-LEG.— Quite abundant on the plains. Nests in the buttes. Especially numerous after August 20.

63. **Aquila chrysaëtos.** GOLDEN EAGLE.— A common resident about the high buttes. Aeries were seen in the Cave Hills and in the Short Pine Hills.

64. **Haliæetus leucocephalus.** BALD EAGLE.— Rare. One seen July 20 on the Little Missouri.

65. **Falco mexicanus.** PRAIRIE FALCON.— Abundant summer resident in the badlands and elsewhere where clay cliffs occur.

66. **Falco peregrinus anatum.** DUCK HAWK.— Rare. Seen twice.

67. **Falco columbarius.** PIGEON HAWK.— Rare autumn migrant along the Little Missouri Valley.

68. **Falco sparverius.** SPARROW HAWK.— Abundant summer resident on the plains.

69. **Pandion haliaëtus carolinensis.** OSPREY.— One seen September 2 along the Little Missouri River.

70. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— Abundant resident in the badlands and about the steeper buttes.

71. **Asio flammeus.** SHORT-EARED OWL.— Grinnell reports that they saw several along the river bottom of the Little Missouri.

72. **Speotyto cunicularia hypogæa.** BURROWING OWL.— Abundant in some of the prairie-dog towns.

73. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.— One observed July 11 in the Little Missouri Valley within six miles of the Montana line, and a short distance north of Harding County, in North Dakota.

74. **Ceryle alcyon.** KINGFISHER.— A few pairs nested along the Little Missouri River, and one on the largest stream of Cave Hills.

75. **Dryobates villosus.** HAIRY WOODPECKER.— Rare summer resident in the forested buttes and along the Little Missouri near Camp Crook.

76. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Much more frequently seen than the preceding.

77. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— An abundant summer resident in the groves of the Little Missouri Valley, and sparingly in the buttes.

78. **Colaptes auratus luteus.** NORTHERN FLICKER.— Breeds wherever trees occur; much more frequent east of the Little Missouri than west of it.

79. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— A common summer resident in and west of the Little Missouri Valley. Rare to the eastward.

80. **Phalænoptilus nuttalli.** NUTTALL'S POORWILL.— A frequent breeder in the high buttes. One was seen on the mesa of Cave Hills, one in badlands in Slim Buttes, and a third was flushed in an arroya at the base of Slim Buttes. They were heard each night during the two weeks spent about the Cave Hills.

81. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.— Common breeder in the plains.

82. **Aëronautes melanoleucus.** WHITE-THROATED SWIFT.— Several pairs nested on the high castellated buttes of Slim Buttes and a few at the north end of the East Short Pine Hills.

83. **Tyrannus tyrannus.** KINGBIRD.— Nests sparingly, usually in box-elder trees, wherever trees occur.

84. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Rare in the area under discussion. One pair nested in the foothills of the Cave Hills and two more in the extreme eastern and southeastern portions of the county. Their favorite nesting site, a small tree near a farm house on the plains, is almost lacking as yet.

85. **Sayornis saya.** SAY'S PHŒBE.— Abundant summer resident wherever cliffs occur. Therefore most numerous in the badlands.

86. **Myiochanes richardsoni.** WESTERN WOOD PEWEE.— Nests rarely in the forested parts of the high buttes.

87. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— One was seen in Slim Buttes August 20.

88. **Empidonax trailli.** TRAILL'S FLYCATCHER.— Nests, not frequently, along the Little Missouri and in cañons of the forested buttes.

89. **Empidonax minimus.** LEAST FLYCATCHER.* — A pair nested in a grove in a valley in Cave Hills.

90. **Otocoris alpestris leucolæma.** DESERT HORNED LARK.— One of the four most numerous residents of the plains. A nest with four eggs was found July 15. We estimated that there were perhaps twenty-five adults to each section (640 acres) of land.

91. **Pica pica hudsonia.** MAGPIE.— Common resident in groves in the Little Missouri Valley and in cañons of the buttes which are filled with deciduous trees.

92. **Corvus corax principalis.** RAVEN.— Reported by Catron to be abundant at Camp Crook during the very coldest weather only. "Ravens were seen almost every day on the way to the Black Hills. They had bred on many of the lofty buttes that we passed." (Grinnell.)

93. **Corvus brachyrhynchos.** CROW.— A common migrant. This year a few nested near Camp Crook in the Little Missouri Valley. This is reported as exceptional.

94. **Nucifraga columbiana.** CLARKE'S NUTCRACKER.— Quite abundant summer resident in the forested Short Pine Hills.

95. **Cyanocephalus cyanocephalus.** PIÑON JAY.— Abundant breeder in the North Cave Hills. Not seen elsewhere in Harding County.

96. **Dolichonyx oryzivorus.** BOBOLINK.— Rare summer resident along the Moreau River. (Three were seen September 15 two hundred miles northwest of the area under discussion.)

97. **Molothrus ater.** COWBIRD.— Grinnell found this species numerous. We found it very rare.

98. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— An occasional migrant only, because of absence of reedy marshes.

99. **Agelaius phœniceus fortis.** THICK-BILLED RED-WING.— A common migrant. A few pairs nested in a tiny marsh in the North Cave Hills.

100. **Sturnella neglecta.** WESTERN MEADOWLARK.— Abundant nester on the plains and on the mesas of the buttes. We estimated that there were about ten pairs to each section of land.

101. **Icterus bullocki.** BULLOCK'S ORIOLE.— One pair was found nesting in a grove in the Little Missouri Valley July 20.

102. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Abundant breeder. Fifty or so fly around together after the breeding season. Ecologically they replace the Cowbird, the Redwing, the Grackle, and the Yellowhead. That is to say, they inhabit groves, etc., much as do the Grackles; they follow the plow, etc., as do the Yellow-heads; they hang about streams as do the Redwings; they follow the cattle as do the Cowbirds; and in addition, they wade in the water as do Snipe.

103. **Loxia curvirostra minor.** CROSSBILL.— A frequent summer resident wherever trees are plentiful. After the breeding season they fly about in flocks of twenty or thirty.

104. **Astragalinus tristis.** GOLDFINCH.— Not uncommon during the summer.

105. **Spinus pinus.** PINE SISKIN.— A small flock was seen early in September.

106. **Passer domesticus.** ENGLISH SPARROW.— Abundant in the only large town, Camp Crook, even when there was no railroad nearer than 80 miles.

107. **Calcarius pictus.** SMITH'S LONGSPUR.— Probably seen twice during July.

108. **Calcarius ornatus.** CHESTNUT-COLLARED LONGSPUR.— Abundant breeder on the plains of the eastern part of the county; less numerous westward.

109. **Rhynchophanes mccowni.** MCCOWN'S LONGSPUR.— Abundant on the plains. This and the preceding probably outnumber the Horned Larks. A nest containing young just hatched was found July 16.

110. **Pocecetes gramineus confinis.** WESTERN VESPER SPARROW.— A common summer resident on the plains. Very frequently seen during the first half of September.

111. **Passerculus sandwichensis alaudinus.** WESTERN SAVANNAH SPARROW.* — Rare migrant, seen September 1–6.

112. **Ammodramus bairdi.** BAIRD'S SPARROW.— Breeds rarely in the moister draws of the steppe. Common as a migrant towards the close of August and early in September. Collected.

113. **Ammodramus savannarum bimaculatus.** WESTERN GRASSHOPPER SPARROW.— Nests in the moister blue-stem swales of the eastern part of the area.

114. **Passerherbulus henslowi occidentalis.** WESTERN HENSLOW'S SPARROW.* — One seen September 4.

115. **Chondestes grammacus strigatus.** WESTERN LARK SPARROW.— A common breeder in the groves along the streams. They left the region about August.

116. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— A few were seen several times early in September.

117. **Spizella passerina arizonæ.** WESTERN CHIPPING SPARROW.— Rare summer resident along the Little Missouri. Quite numerous in the Slim Buttes during the last half of August.

118. **Spizella pallida.** CLAY-COLORED SPARROW.— Seen once in July on the plains.

119. **Spizella pusilla arenacea.** WESTERN FIELD SPARROW.* — Not uncommon on the foothills of the higher buttes, where suitable situations occur — copses and grass. Occasional elsewhere.

120. **Junco aikeni.** WHITE-WINGED JUNCO.— Common nester in the Short and Long Pine Hills. Fledgelings observed Ju'y 20 in the Long Pines.

121. **Melospiza melodia.** SONG SPARROW.— Nests in each of the suitable localities about the buttes. Quite common as a migrant after August 21.

122. **Melospiza georgiana.** SWAMP SPARROW.— One seen August 22 on the Moreau River.

123. **Pipilo maculatus.** ARCTIC TOWHEE.— Abundant breeder wherever woods occur.

124. **Zamelodia melanocephala.** BLACK-HEADED GROSBEAK.— Abundant nester in those parts of the Little Missouri Valley which are well filled with cottonwood groves. One was observed to sing while flying, a song much resembling that of the Western Mockingbird.

125. **Passerina amœna.** LAZULI BUNTING.— A rare breeder in the forested buttes.

126. **Calamospiza melanocorys.** LARK BUNTING.— One of the most numerous summer residents of the plain. Most of the males have moulted by August first, when migration is under way. However, a mother was observed to feed a fledgeling as late as August 31.

127. **Piranga ludoviciana.** WESTERN TANAGER.— One seen August 27 in the Short Pine Hills.

128. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Abundant nester on the cliffs of badlands and along streams wherever such cliffs occur. The only swallow seen frequently.

129. **Hirundo erythrogastra.** BARN SWALLOW.— A pair or two nest about the sheds of each of the old ranches, and in Camp Crook. They do not wander far from their nests.

130. **Riparia riparia.** BANK SWALLOW.— One small colony is established on the North Fork of the Grand River.

131. **Bombycilla garrula.** BOHEMIAN WAXWING.— A large flock is reported to have spent several days in the Short Pine Hills during February, 1910.

132. **Bombycilla cedrorum.** CEDAR WAXWING.— A common summer resident in the pine-forested parts of the buttes.

133. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE. — Abundant summer resident of the plains. Nests in the scattered trees which occur along the intermittant "creeks."

134. **Vireo olivaceus.** RED-EYED VIREO.* — Not a rare nester in the wooded cañons of Slim Buttes.

135. **Vireosylva gilva swainsoni.** WESTERN WARBLING VIREO.— Common during the summer in the woody areas.

136. **Dendroica æstiva.** YELLOW WARBLER.— Nests commonly in the cañons along the brooks of the buttes, and along the Little Missouri.

137. **Dendroica auduboni.** AUDUBON'S WARBLER.— Nests in the pine forests of the higher buttes; fairly common.

138. **Seiurus aurocapillus.** OVENBIRD.[1] — Noted, not rarely, in the Short and Long Pine Hills. Fledgelings observed in the latter July 20.

139. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH.* — Three seen along the river early in September.

140. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT. — Breeds commonly along the permanent streams.

141. **Icteria virens longicauda.** LONG-TAILED CHAT.— Nested abundantly in the most wooded portions of the Little Missouri flood plain.

142. **Wilsonia pusilla.** WILSON'S WARBLER.* — An abundant migrant, arriving August 19.

143. **Anthus spraguei.** SPRAGUE'S PIPIT.— Common breeder on the grassy plains of the northeastern part of the county. Abundant migrant. The call, *ché, ché,* is then frequently heard.

144. **Dumetella carolinensis.** CATBIRD.— Not common during the summer, in the groves along the streams.

145. **Toxostoma rufum.** BROWN THRASHER.— More numerous than the preceding, in similar situations.

146. **Salpinctes obsoletus.** ROCK WREN.— Breeds abundantly

[1] Omitted by error from previous list.

wherever steep slopes with crevices occur. Hence especially noticeable in badlands and on the cliffs of the steep-sided buttes.

147. **Troglodytes aëdon parkmani.** WESTERN HOUSE WREN.— Nests abundantly in the more wooded portions of the Little Missouri Valley and in the pine forests of the high buttes.

148. **Sitta canadensis.** RED-BELLIED NUTHATCH.— A common resident in the pines of the buttes.

149. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— Breeds abundantly in the forests of the buttes. Common later in the woods elsewhere.

150. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.— Rare migrant.

151. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.* — Not uncommon along the Little Missouri, August 27–September 3.

152. **Planesticus migratorius.** ROBIN.— Breeds tolerably commonly in the buttes and along the Little Missouri River.

153. **Sialia sialis.** BLUEBIRD.— Common breeder in the pines of the higher buttes.

154. **Sialia currucoides.** MOUNTAIN BLUEBIRD.— A brood was seen in the Short Pine Hills. Grinnell also reports seeing a brood of young there in 1874.

DOUBLE-CRESTED CORMORANTS BREEDING IN CENTRAL ILLINOIS.[1]

BY FRANK SMITH.

THE Double-crested Cormorant (*Phalacrocorax auritus*) is well known in Illinois as an abundant migrant along the Illinois River bottomlands in both spring and autumn, when flocks of several hundred may sometimes be seen for periods of several weeks taking heavy toll from the fish life of the region.

The southern limit of their breeding range east of the Mississippi River seems to be not very well known. Kumlien and Hollister in 'The Birds of Wisconsin' (1903) suggest that they probably nest in certain counties in the northern part of that State and cite

[1] Contributions from the Zoölogical Laboratory, University of Illinois, under the direction of Henry B. Ward, No. 6.

Carr (1890) as authority for the statement that they breed about some of the larger isolated lakes in the northern and central part of the State. No reference has been found by the writer to their breeding in Illinois but there is pretty good evidence that they have bred in small numbers more or less regularly for several years in the Illinois River bottomlands near Havana, the site of the Illinois Biological Station. The breeding locality is about thirty miles south of Peoria.

The writer first learned of cormorants nesting there, on June 18, 1909, when in company with a party of naturalists of the State he was shown a family of living young birds pretty well grown which with the nest had been brought to Havana from the vicinity of Clear Lake, about twelve miles up the river. We were told that there were other nests with young in the same locality. Mr. Frank C. Baker of the Chicago Academy of Science secured the specimens and took them to Chicago where the photograph which is the original of an accompanying illustration was made by Mr. F. M. Woodruff.

In July, 1910, the writer, in company with Professor Charles F. Hottes of the botanical department of the University of Illinois, visited each of the only two nesting places which we could locate. We found a total of nine nests of which two contained eggs and none had nestling birds. We learned that at least one set of eggs had been taken by a fisherman earlier in the summer.

The opening of the Chicago Drainage Canal about ten years ago has been followed by permanently higher water levels in the lower part of the Illinois River valley and many former bottomland marshes and swamps have been converted into wide stretches of open water. This has been accompanied by the death of many of the trees growing at certain levels. In both of the nesting places visited, the birds had selected dead trees which were standing in open water a few feet deep and from which the open water with scattering dead trees extended for long distances in various directions.

The first nesting place visited was at Clear Lake, about twelve miles north of Havana and in the same vicinity as that from which the young birds had been taken the preceding summer. At the time of the visit, July 2, 1910, two dead ash trees but a few rods

apart contained each two nests. Of the two nests in each tree one was empty and the other contained a set of three eggs. The eggs of neither set had been long incubated but the nests were apparently deserted and no living cormorants were seen in the immediate vicinity. A dead adult hanging from a limb of a tree near-by gave reason for the supposition that the little colony had been broken up by hunters or fishermen. About a half mile from these two trees another tree was found which contained two nests, both empty. Five adults were seen flying or swimming near-by. The six nests referred to above were from twenty-four to thirty-two feet above the water but could not well be placed higher as all the trees of the immediate vicinity were rather small.

On July 14, 1910, a visit was made to a nesting place about five miles north of Havana at the head of Dogfish Lake where two tall dead cottonwood trees were found in close proximity, one of which had one nest and the other had two nests. One of the latter was dislodged during a violent wind storm after our arrival but before the photograph was taken. The nests were at least fifty feet above the water.

Soon after the storm had passed and before we had gone very near to the nests, small flocks of cormorants from neighboring lakes began arriving and finally twenty-one of them were perched in the two nest-bearing trees before we disturbed them by our approach. None of them seemed to pay any special attention to the nests, and as we afterwards saw no signs of life therein we conjectured that young birds might already have been reared and have left the nest and were perhaps included in the flocks. We could not get near enough to determine whether or not any of them were juvenile. It was nearly a month later in the season than the time at which well grown birds had been found the preceding year.

Although this latter nesting place was much nearer to Havana than the first one, it was not in the line of regular travel, was not known to as many people, and I have no knowledge of the birds having been molested.

Inquiries among fishermen and hunters disclosed the fact that cormorants' nests have been built in the Havana region for a number of years past and while it was difficult to get very definite

information we found reason for believing that there was a somewhat close relation between the beginning of the cormorants' nesting in the region and the dying of large numbers of trees after the opening of the Chicago Drainage Canal. There is very little probability that they remained in the vicinity during the summers of 1894–98, as the writer and various other persons who were familiar with birds and who worked at the Illinois Biological Station during those seasons did not see them except during migration, while during the past two summers they were frequently seen near the Station throughout July and August. The Station was not located at Havana during the interval between the years 1900 and 1909.

The fishermen of the region know these birds as Nigger Loons and detest them because of their destructiveness to fish. They were rather reticent but there seemed good reason for inferring that the Clear Lake colony had been "shot out" and it seems hardly probable that the establishment of large breeding colonies would be permitted.

THE WARBLERS IN WAYNE COUNTY, MICHIGAN, IN 1909.

BY J. CLAIRE WOOD.

BUSINESS confined the writer mainly to River Rouge Village during the spring of 1909. In the adjacent village of Ford an orchard extended from the Detroit River westerly into Ecorse Township and terminated near a small piece of timber; all being on what is known as Private Claims 112 and 113. Here, spare afternoons were devoted to warbler observations. May 16 and 23 were spent five miles inland on P. C. 32, Ecorse Township. This woods is about one mile long and one end lies in the bottom

lands of the River Rouge, the home of a pair of Red-shouldered Hawks and Green Herons. The two above localities will be designated respectively as the river district and the inland district, while the autumn river district refers to some twenty acres of woods on Section 24, Monguagon Township, eight miles south of the spring district. No such intensive observation was given the autumn migration, both the waders and the raptores receiving a share. An accident confined me to the house during the first two weeks in October but the inland district was carefully worked October 16 and 17 with gratifying results. I tried again October 24 but saw nothing except Myrtle Warblers and abandoned the warblers for the year.

The last week in April was cold and cloudy, culminating on the night of the 28th and morning of the 29th in the greatest snowfall so late in the season in the history of the local weather bureau, covering 26 years. A very brisk wind with the temperature at 37° and an almost continuous snowstorm distinguished May 1, and the 2d was very similar except that it did not snow as much. Unfavorable as these conditions were the warblers began to arrive, the Palm and Myrtle late but the Black and White and the Yellow about on time. The wholly transient migration terminated between two days. Seven species were present May 27 and four on the 29th. May 30 we spent all day in the inland district, but the only wholly transient of any kind was a female Philadelphia Vireo, though such warblers as the Cerulean and Golden-winged were still migrating. May 16 was distinctly warbler day. In the heart of the woods on the inland district they were congregated on the ground along the margin of a water-covered section and the same day similar conditions were observed by Mr. Bradshaw H. Swales on Grosse Isle, and by Mr. Jefferson Butler on Belle Isle. A brisk wind was blowing causing much swaying of branches and vibrating of leaves above but whether it was the insects or the warblers that were forced down could not be determined. Such a congestion of warblers I do not expect to see again. There were hundreds of them within a hundred yard radius. Hopping here and there or quickly fluttering over one another or jumping into the air to capture a passing insect the general effect, as one glanced along the forest floor, was a suggestion of whirling and drifting

autumn leaves. There was a perceptible west to east movement, a few continually arriving and departing. We watched them several hours but could detect no immature birds nor abnormal plumages. Twenty-two species were counted, the greater number being Chestnut-sided and Blackburnian, closely followed by Magnolia and Black-throated Green, while at the other extreme were the Tennessee, Orange-crowned, Parula and Cape May.

The sexes are so near alike in such warblers as Nashville, Tennessee, Orange-crowned and Palm that even in spring, without the birds in hand, no one can acquire an accurate idea of the relative abundance of the two sexes, nor the amount of time the males precede the females, while in autumn, age becomes an important factor. Age and sex were determined from specimens collected and constitute the value of the following list.

Black and White Warbler (*Mniotilta varia*).— The river district was not suitable and only five were observed all spring, a male May 1, two on the 2d and a pair on the 19th. Common inland both spring and autumn. Noted a male and female October 16. Not observed during the summer.

Golden-winged Warbler (*Vermivora chrysoptera*).— A common summer resident in some sections. Forty-five were counted in the large flock May 16, which is the most I have seen together. Last for the year, August 22, when twelve were counted, including old, young and both sexes.

Nashville Warbler (*Vermivora rubricapilla*).— The two seen May 8, and the four on the 9th, were males. Fourteen, May 15, were of both sexes and the most seen in one day. Eleven, May 19, were the last in spring. Seen only on the river district in autumn; an adult male September 12 and another on the 19th.

Orange-crowned Warbler (*Vermivora celata*).— Three in the large flock, May 16, the two examined being a male and female.

Tennessee Warbler (*Vermivora peregrina*).— Tolerably common on the river district May 15 to 27, both inclusive. The females appeared with the males from the first day and in equal numbers. A male in the large flock May 16 and two in the same woods May 23 were the only inland records for the year. An immature bird, September 12, in the river district was the only autumn record. I have given the warblers close attention, begin-

ning with the autumn of 1904. This warbler was absent that autumn but the most common woodland transient during the following four years in autumn, and rare or absent in spring.

NORTHERN PARULA WARBLER (*Compsothlypis americana usneæ*). — Three females in the large flock, May 16, and a junior female in the same woods October 16. An adult male on the river district September 19. The local birds are referable to Ridgway's proposed form *ramalinæ* which was not accepted in the A. O. U. Check-List and we revert to *usneæ*.

CAPE MAY WARBLER (*Dendroica tigrina*).— A male and female in the large flock of May 16. In the same woods an adult male was noted October 16 and another on the 17th. Two adult males noted in the river district August 29.

YELLOW WARBLER (*Dendroica æstiva*).— A single bird was seen April 27 and the second May 2. The first females appeared May 9 when the species became common and established for the summer. An adult male seen August 15 was the last for the year.

BLACK-THROATED BLUE WARBLER (*Dendroica cærulescens*).— Two males and three females on the river district May 19. Four males and three females in the large flock, May 16, and six females in same woods May 23. More common in autumn, the season opening with a female August 29 and closing with two males and two females October 17.

MYRTLE WARBLER (*Dendroica coronata*).— Common on the river district. Noted a female April 25 and a male and female on the 28th. Twenty-five counted May 1, in numbers about equally divided as to sex. Only four females among the thirty May 8 but sexes about equally divided on other dates, including the fifteen May 19, which were the last in spring. Not seen inland though I expected to find a few in the large flock of May 16. Common, both along the river and inland in autumn. Counted thirty October 24, and they undoubtedly remained later.

MAGNOLIA WARBLER (*Dendroica magnolia*).— In the river district a male was noted May 15, flocks, including both sexes, May 19 and 27, and one female May 29. Common inland. The numbers estimated in the large flocks of May 16 was 175. Seen August 29 to September 12 in the river district; all junior birds after the former date.

CERULEAN WARBLER (*Dendroica cerulea*).— First seen in the large flock of May 16, when 46 were counted. Last seen August 22, three adult males and a junior female. June 20, we were locating a Cooper's Hawk's nest in a long narrow piece of woods on P. C. 24, Grosse Pointe Twp., when I heard the song of a Cerulean. A systematic search disclosed two nests, one containing three and the other four eggs; both were complete sets as incubation was far advanced.

CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*).— Three in the river district, May 15, were the first seen, and two on the 27th were the last of the spring migration. This species was the most abundant of all the warblers in the flock of May 16. A conservative estimate, agreed upon by Mr. Herbert H. Spicer and the writer, fixed their numbers at 300. Seen twice in summer. June 13, while locating a Marsh Hawk's nest in a bushy tangle with many openings grown to marsh grass in Gratiot Twp., a female Chestnut-sided acted as if breeding, and a male was noted in the same locality July 25. A junior male in the river district, September 12, was the only autumn record.

BAY-BREASTED WARBLER (*Dendroica castanea*).— Three males, on the river district, May 15; also, three on the 19th and one on the 27th. The eight in the large flock of May 16 were males. Females were seen only May 23. Not observed in autumn until September 12, when twelve were seen. A female was taken October 16 and another on the 17th. No adults seen during the autumn.

BLACK-POLL WARBLER (*Dendroica striata*).— This species has always been rare in spring and our most common autumn migrant, owing to its uniform and unfailing abundance. Two males on the river district, May 29, and one male inland, May 23. Fifty-nine were counted on the river district August 29 and consisted of juniors and adults. The last were three junior birds, September 26, which was my last day afield until October 15. I believe the four warblers seen October 16 were of this species but they were not taken.

BLACKBURNIAN WARBLER (*Dendroica fusca*).— Five males on the river district, May 19, but only two males among the fifteen seen May 27. Inland, 260 were counted in the large flock of May

16, and they were still common on the 23d, the sexes being about equal in numbers. An adult and a young male were noted in this woods August 22. On the river district three junior birds seen August 29, ten, mostly adults, September 12, and an adult male September 19.

BLACK-THROATED GREEN WARBLER (*Dendroica virens*).— The twenty-five counted May 8 and 9 were mostly males, after which the sexes were about equally divided in numbers. A male May 29 was the last in spring. In the large flock of May 16, 180 (estimated). First autumn individual noted September 5, and seven on the 6th; all junior birds. October 16, two adult males and two junior males were noted, and on the 17th, one adult male and female, three junior males, and one junior female.

PALM WARBLER (*Dendroica palmarum*).— Tolerably common on the river district. The four noted May 1 and one May 2 were all males. May 8 only three of the eighteen seen were examined and these were males. The fourteen seen May 9 consisted of four males and ten females. No males observed after this date, the season closing with three females May 15. Two females in the large inland flock of May 16. Absent in autumn. Somewhat rare in autumn and entirely absent some years. Tolerably common only September 20 and 27, 1908.

OVENBIRD (*Seiurus aurocapillus*).— The river district is not suitable for them and none were seen until the inland visit May 16, when nine were counted, and eighteen mated pairs on the 23d. An adult male, September 26, was the last for the year. July 4, I was stalking a Green Heron on P. C. 404, Gratiot Twp., when an Ovenbird flushed from her nest containing four slightly incubated eggs — rather late.

WATER-THRUSH (*Seiurus noveboracensis*).— No suitable territory for this species was visited during the year, which accounts for its rarity on this list. A female was flushed from a bush pile on high ground May 19, another in a flock of Redstarts August 15, and the first autumn transient and a third female on the 29th were all we noted during the year.

LOUISIANA WATER-THRUSH (*Seiurus motacilla*).— Two inland, May 16, were the only ones seen during the year. This species is a summer resident in certain restricted areas.

CONNECTICUT WARBLER (*Oporornis agilis*).— One male, in the inland district, May 23.

MARYLAND YELLOW-THROAT (*Geothlypis trichas*).— Not seen until May 15, after which it became common. On P. C. 344, Gratiot Twp., I found a nest containing three pipped eggs, one young and a young Cowbird. Mr. Spicer found a nest with three eggs on P. C. 618, same Twp., June 6.

WILSON'S WARBLER (*Wilsonia pusilla*).— Tolerably common on the river district May 15 to 29. No females seen until the 27th, and the four seen on the 29th were two males and two females. Two noted in the large flock of May 16. An immature bird on the river district September 6, was the only autumn record.

CANADIAN WARBLER (*Wilsonia canadensis*).— On the river district a male was noted May 15, two males and a female May 19, and five males and a female May 27. Common inland May 16 and 23. A female, August 29, was the only autumn record.

REDSTART (*Setophaga ruticilla*).— The first seen for the year was a male May 9, and the last were two females October 17. Only exceeded by *D. æstiva* in abundance as a summer resident. June 6, on P. C. 620, Gratiot Twp., Mr. Spicer and the writer were locating chats near some twenty acres of woods that has always been a favorite Redstart haunt. Later in the day we walked through this woods and in less than an hour found a set of one, two sets of three, six sets of four, and one of five, besides seeing five nests with the birds on that we failed to reach, and eight unfinished nests.

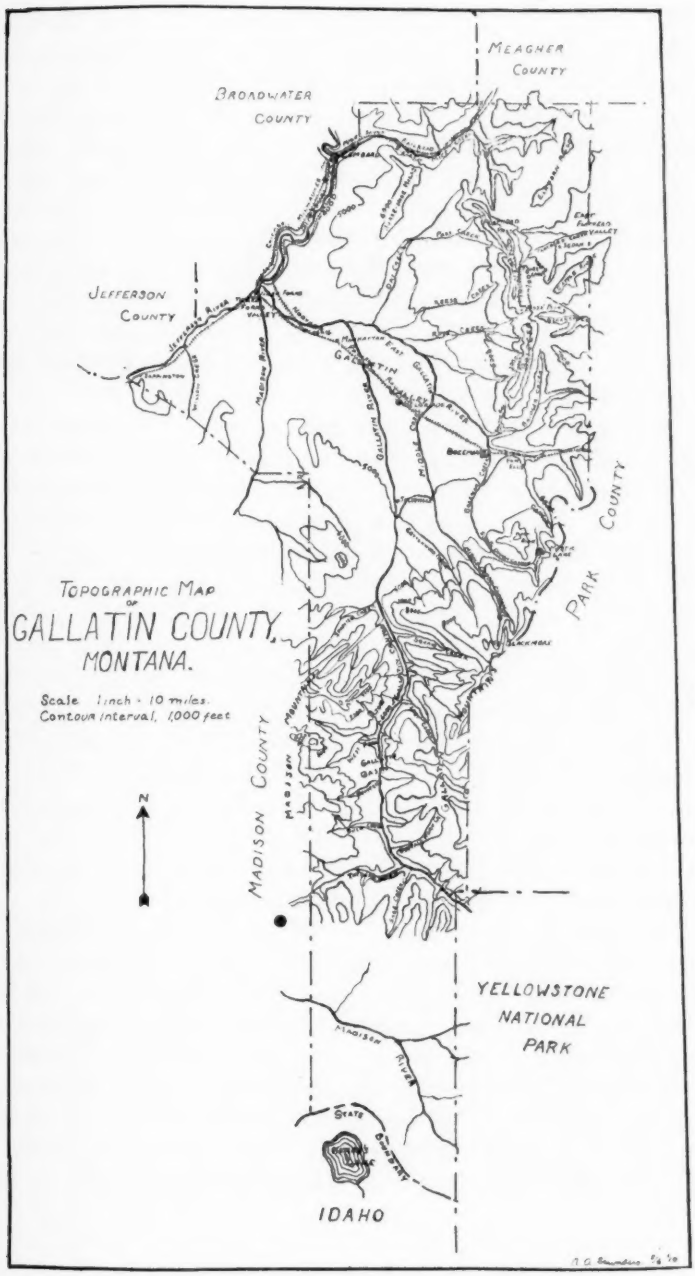
A PRELIMINARY LIST OF THE BIRDS OF GALLATIN COUNTY, MONTANA.

BY ARETAS A. SAUNDERS.

GALLATIN COUNTY lies in what has been termed south-central Montana. Its southern extremity is formed by the juncture of the Montana-Idaho State line with the western border of the Yellowstone National Park. From here it extends north to Lombard on the upper Missouri River, including practically the entire drainage of the Gallatin River, the lower portions of the Madison and Jefferson Rivers and a small portion of the upper Missouri River. The eastern boundary of the county practically coincides with the main divide between the Yellowstone and Missouri River drainages, except in the northeastern part of the county where it includes, in Brackett and Flathead Creeks, a small part of the Yellowstone drainage.

This territory extends from an elevation of 4,000 feet on the Missouri River to nearly 11,000 feet in some of the higher peaks of the Gallatin and Madison ranges. It includes many types of country but in the main may be divided into two large divisions, the valleys and the mountains. There are three main valleys in the county, the Gallatin and Three Forks Valleys in the northwestern part and what is known as the East Flathead Valley in the northeastern part.

The Gallatin Valley extends from the northern and western mountain slopes, north along the Gallatin River and its tributaries to about the vicinity of Logan. It is the most productive grain-growing region of Montana and consists principally of broad wheat fields crossed by many irrigating ditches. The common breeding birds of these fields are the Killdeer, Western Meadowlark, Bobolink, and Western Vesper and Savannah Sparrows. About the clusters of buildings other species such as the Arkansas Kingbird, Barn and Cliff Swallows, Western House Wren and Mountain Bluebird are abundant. Along the larger streams are cottonwood groves which attract such species as the Kingbird, Western Wood Pewee, Least Flycatcher, Cassin's Purple Finch,


MEAGHER COUNTY
BROADWATER COUNTY
JEFFERSON COUNTY
PARK COUNTY
MADISON COUNTY
TOPOGRAPHIC MAP OF GALLATIN COUNTY, MONTANA.
Scale 1 inch = 10 miles.
Contour interval, 1000 feet
N
YELLOWSTONE NATIONAL PARK
IDAHO

Pine Siskin, Western Chipping Sparrow, Western Warbling Vireo, Yellow Warbler and Western Robin. Most of these species are abundant in the cottonwood shade trees in the streets of Bozeman. In many places along the streams there are extensive thickets of willow and alder, often swampy in character. These thickets attract a larger number of species than any other type of country. The commoner species are Wilson's Snipe, Mourning Dove, Marsh Hawk, Western Crow, Magpie, Brewer's Blackbird, Western Goldfinch, White-crowned Sparrow, Mountain Song Sparrow, Slate-colored Fox Sparrow, Arctic Towhee, Black-headed Grosbeak, Yellow Warbler, MacGillivray's Warbler, Western Yellowthroat, Redstart, Catbird, Long-tailed Chickadee, Willow Thrush and Western Robin.

The Three Forks Valley lies at the head of the Missouri River and along the lower Madison and Jefferson Rivers. It is much lower than the Gallatin Valley, the average elevation being little over 4,000 feet. Only a small part of this valley is under cultivation. The soil averages much coarser and less fertile than the Gallatin Valley and there is a larger percentage of rolling grass land more suitable for grazing than agriculture. For this reason and also probably partially because of the elevation, there are several species quite common here, which occur rarely, locally or not at all in the Gallatin valley. Some of these are the Long-billed Curlew, Mountain Plover, Desert Horned Lark, Yellow-headed Blackbird, Western Grasshopper Sparrow and Lark Bunting. Water and shore birds are more abundant here, particularly in migrations, than in other parts of the county. I have had but few opportunities to visit this valley and believe that many additional facts and species will be found here later.

The East Flathead Valley is of higher elevation than either of the others, averaging about 5,600 feet. A large part of this valley consists of broad flat sagebrush land and because of this, it is the only part of the county where such species as the Sage Grouse, Sage and Brewer's Sparrows and Sage Thrasher are at all common.

The mountainous portions of Gallatin County consist principally of three main ranges. These are the Gallatin and Madison Mountains on the east and west sides of the Gallatin River in the southern part of the county, and the Bridger Mountains, west of the

Gallatin Valley, in the northeastern part of the county. Beside these there are the Horse-shoe Hills, of much lower elevation, just north of the Gallatin Valley. The elevation of the mountains extends from 5,000 feet in the lower foothills to nearly 11,000 feet in the higher peaks. They consist of long slopes clothed with dense evergreen forests, dotted by mountain meadows and small lakes and broken by high rocky ridges and deep cañons, the latter containing many swift streams and waterfalls.

The foothills, lying along the lower slopes next to the valleys, are grown with groves of aspen, thickets of thorn, service berry and wild rose, sagebrush and scattered clumps of Douglas fir. The commoner breeding birds of the foothills are the Canadian Ruffed Grouse, Lewis's Woodpecker, Red-shafted Flicker, Red-naped Sapsucker, Wright's Flycatcher, Magpie, Cassin's Purple Finch, White-crowned Sparrow, Arctic Towhee, Green-tailed Towhee, Lazuli Bunting, Western Yellowthroat, MacGillivray's Warbler and Catbird.

The cottonwoods, willows and alders of the valleys extend into the lower mountain cañons and form groves and thickets, the latter often as high as 7,500 feet, where such birds as the Desert Sparrow Hawk, Rufous Hummingbird, Hammond's Flycatcher, Pine Siskin, White-crowned Sparrow, Mountain Song Sparrow, Lincoln's Sparrow, Pileolated Warbler, Redstart, Long-tailed Chickadee and Western Robin are breeding birds. Along the mountain streams the Dipper and Spotted Sandpiper are common, while in the limestone cliffs forming the cañon walls such species as the Duck Hawk, Violet-green Swallow and Rock Wren breed.

The mountain forests are composed principally of lodgepole pine (*Pinus murreyana*), Douglas's fir (*Pseudotsuga taxifolia*), and Engelmann's spruce (*Picea englemanni*) with other species such as limber pine (*Pinus flexelis*) and alpine fir (*Abies lasiocarpa*) forming alpine forests near timber line. The common breeding birds of the mountain forests are Dusky Grouse, Canadian Ruffed Grouse, Western Red-tailed Hawk, Rocky Mountain Hairy Woodpecker, Batchelder's Woodpecker, Alpine Three-toed Woodpecker, Black-headed Jay, Rocky Mountain Jay, Clark's Nutcracker, Rocky Mountain Pine Grosbeak, Cassin's Purple Finch, Pine Siskin, Western Chipping Sparrow, Pink-sided Junco, Western Tanager,

Western Warbling Vireo, Audubon's Warbler, Rocky Mountain Creeper, Mountain Chickadee, Ruby-crowned Kinglet, Western Golden-crowned Kinglet, Townsend's Solitaire, Olive-backed Thrush, Audubon's Hermit Thrush, and Western Robin. Most of these species are more abundant about the edges of mountain parks than in the forests themselves. The Pine Grosbeak occurs, in the breeding season, only in the alpine forests and the Nutcracker is more abundant here than elsewhere. The Cassin's Purple Finch, Western Tanager, and Ruby-crowned Kinglet show a decided preference for forests of Douglas fir to that of any other species, while the Golden-crowned Kinglet and Rocky Mountain Creeper are most abundant in tall spruces along the cañon bottoms.

In compiling this list I have consulted, I believe, all the previously published records from this region. The earliest records are contained in government publications. One of these [1] contains records of several species of shore birds from the vicinity of Fort Ellis, of the occurrence of which there are at present no other records, though the species are probably not uncommon in the region. The most complete and most important work on the birds of this region which has hitherto been published is 'The Birds of South-Central Montana,' by C. W. Richmond and F. H. Knowlton.[2] This list consists of 111 species, nearly all of which were recorded from Gallatin County. The observations were made in 1888 and 1890 and reveal a number of interesting and important changes in the bird life of the region since that time. In addition to this, two short articles on birds in the vicinity of Salesville, by A. M. Pyfer, appeared in 'The Oölgist.'[3] One of these contains the only present record of the Snow Bunting in this region.

A number of valuable records in this list were obtained from an examination of the collection of birds at the Montana Agricultural College at Bozeman, most of which was made in Gallatin County.

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[1] Report of a Reconnaissance from Carroll, Montana, to the Yellowstone National Park and return. Gov't. Printing Office, 1876. Zoölogy, by George Bird Grinnell.

[2] Auk, Vol. IX, 1894, pp. 298–308.

[3] The Nesting of Clark's Nutcracker. The Oölogist, Vol. XIV, 1897, pp. 100–110, and Birds of Montana. The Oölogist, Vol. XV, 1898, pp. 14, 15.

The remaining data were obtained from various sources but principally from the observations of Mr. Gerald B. Thomas and myself. Mr. Thomas was in this region from the fall of 1908 to August, 1909, while my own stay lasted from July, 1908, to August, 1909, with a few short visits since that date. During that time I was assigned to work on the Gallatin National Forest and had a good opportunity to cover nearly all parts of the county.

The migration data given in this list are taken largely from my own notes in the fall of 1908 and spring of 1909. Observations this spring (1910), somewhat further west in Montana, seem to indicate that the 1909 dates were unusually late. For this reason most of the species will probably be found to arrive a week or two earlier, in ordinary years, than the dates indicated in the list.

The accompanying map shows all the localities mentioned in the list. Since elevation is an important factor in the bird life of the region, I have shown this on the map by contour lines at an interval of 1,000 feet, obtaining the data for this from the U. S. Geological Survey sheets, except in the extreme southern part of the county where no data are yet available.

The problem of subspecies in this region is in many cases rather difficult. For this reason I have marked with an asterisk all forms whose subspecific identities have been determined by the examination of specimens from the region. In all other cases the subspecies are assumed.

I wish to acknowledge my indebtedness to the following persons: to Dr. L. B. Bishop for the identification of subspecies and for the use of his library in preparing this list; to Prof. R. A. Cooley and Mr. Wyatt Jones of the Montana Agricultural College for permission to examine the collection of birds there and for much help and information from their observations; to Mr. Gerald B. Thomas for the use of his many notes and observations; and to the Forest Officers of the Gallatin National Forest for information, help and encouragement given me whenever possible.

List of Species.

1. **Colymbus holbœllii.** HOLBŒLL'S GREBE.— I obtained a specimen of this bird which was shot on the Madison River, near Three Forks, on Oct. 17, 1909, by Mr. J. B. Pitts.

2. **Colymbus nigricollis californicus.** EARED GREBE.— I noted a bird of this species on Mystic Lake, Aug. 3, 1909.

3. **Podilymbus podiceps.** PIED-BILLED GREBE.— I saw two of these birds on a small pond near the lower end of Middle Creek Cañon on Aug. 29, 1908.

4. **Gavia immer.** LOON.— Prof. R. A. Cooley told me of a young bird of this species, which was captured alive in the Gallatin Valley.

5. **Larus californicus.** CALIFORNIA GULL.— Seen by Richmond and Knowlton on the Jefferson River in September, 1888.

6. **Larus delawarensis.** RING-BILLED GULL.— Mr. G. B. Thomas noted gulls of this species at Three Forks in June, 1909.

7. **Hydrochelidon nigra surinamensis.** BLACK TERN.— A specimen of this bird, taken just south of Bozeman in the Gallatin Valley, is in the collection at the Montana Agricultural College.

8. **Phalacrocorax auritus.** DOUBLE-CRESTED CORMORANT.— I saw several birds of this species on the Missouri River near Lombard on April 22 and 23, 1909.

9. **Pelecanus erythrorhynchos.**— WHITE PELICAN.— Mr. Chas. Smith of Bozeman told me that he remembered seeing a bird of this species that was shot on a small pond near Fort Ellis about thirty years ago.

10. **Mergus americanus.** AMERICAN MERGANSER.— Two birds of this species, taken on the East Gallatin River, were mounted and on exhibition for a short time, in a store window in Bozeman.

11. **Mergus serrator.** RED-BREASTED MERGANSER.— Richmond and Knowlton recorded this species as noted several times during August and September. I noted it but once, on the Missouri River near Lombard, April 22, 1909.

12. **Lophodytes cucullatus.** HOODED MERGANSER.— Several persons have described this species to me as occurring in pairs throughout the summer on the larger mountain streams. It is probably a regular summer resident in these localities. There is a young bird of this species, taken on Fairy Lake in the Bridger Mountains, in the collection at the Montana Agricultural College.

13. **Anas platyrhynchos.** MALLARD.— An abundant summer resident, breeding commonly in all suitable localities. It appears first in the latter part of March and is abundant until November. It winters occasionally, wherever the streams remain open. I noted it near Sappington on the Jefferson River on Feb. 12, 1910.

14. **Mareca americana.** BALDPATE.— Abundant migrant and occasional summer resident. I noted this species commonly from April 25 to May 14, 1909. Mr. Thomas found a nest of this species on the East Gallatin River, near Bozeman.

15. **Nettion carolinense.** GREEN-WINGED TEAL.— Abundant migrant and probably common as a summer resident, as I have noted it in large numbers as early as Aug. 17, 1909. It arrives early in April and leaves in October.

16. **Querquedula discors.** BLUE-WINGED TEAL.— Common summer resident. More abundant in summer than any other species of duck.

17. **Querquedula cyanoptera.** CINNAMON TEAL.— I noted a male of this species near Fort Ellis on May 14, 1909. Mr. H. A. Cleaveland of Bozeman has shot this species on the Madison River just south of the Gallatin County boundary. It is probably a regular but not common migrant.

18. **Spatula clypeata.** SHOVELLER.— An abundant migrant. On April 22 and 23, 1909, I found this species more abundant than any other duck along the upper Missouri River.

19. **Dafila acuta**. PINTAIL.— I have not met this species, but it is reported by all hunters to be a common migrant. It is said to breed in this region occasionally.

20. **Aix sponsa.** WOOD DUCK.— This species has been taken by local hunters on the East Gallatin River, during migrations. Prof. Cooley saw a pair that were evidently breeding in one of the mountain cañons south of Bozeman.

21. **Marila americana.** REDHEAD.— Reported rather commonly by local hunters. I noted this species on the Gallatin River in the Lower Basin about the West Fork and Beaver Creek on June 29 and 30, 1909.

22. **Marila vallisineria**. CANVAS-BACK.— Mr. H. A. Cleaveland has shot this species on the Madison River in Gallatin County.

23. **Marila affinis**. LESSER SCAUP DUCK.— Regular migrant. I noted this species near Fort Ellis several times during May, 1909.

24. **Clangula clangula americana.** GOLDEN-EYE.— A regular winter resident on the Missouri and Jefferson Rivers wherever the swifter parts of the streams remain open. It remains in spring until late in April.

25. **Charitonetta albeola.** BUFFLE-HEAD.— I have not met this species but it is reported quite commonly by local hunters.

26. **Chen rossi.** Ross's GOOSE.— Mr. Thomas saw a photograph of a bag of game shot at Three Forks by a local hunter in which a bird of this species showed plainly. The bird was said to be one of a flock of eight.

27. **Branta canadensis.** CANADA GOOSE.— An abundant migrant. Said to breed along the Madison River.

28. **Olor columbianus.** WHISTLING SWANS.— Swans are regular migrants on the Madison and Jefferson Rivers. Owing to the recent rarity of the Trumpeter Swan, *O. buccinator*, I have assumed that these birds are of the other species although I have examined none of them. It is probable that both species have occurred in the county and the Trumpeter may even have bred on some of the small lakes. Mr. H. A. Cleaveland told me that in August, 1885, he saw a number of swans with young not yet able to fly on Henrys' Lake, Idaho, just over the divide from Gallatin County.

29. **Botaurus lentiginosus.** BITTERN.— Recorded by Richmond and Knowlton. I have not noted this species.

30. **Ardea herodias.** GREAT BLUE HERON.— Summer resident. I found this species very abundant about Lombard and Three Forks in April, 1909. A small colony breeds in the cottonwoods along the upper Missouri River.

31. **Grus mexicana.** SANDHILL CRANE.— Mr. Wyatt Jones told me that this species formerly bred in aspen groves in the East Flathead Valley near Sedan.

32. **Porzana carolina.** CAROLINA RAIL.— I noted a pair of these birds in a swamp near Sedan on June 4, 1909.

33. **Fulica americana.** COOT.— I noted a bird of this species on Middle Creek, May 26, 1909.

34. **Lobipes lobatus.** NORTHERN PHALAROPE.— Richmond and Knowlton took this species at a mountain pool in September.

35. **Steganopus tricolor.** WILSON'S PHALAROPE.— I noted a pair of these birds near Sedan on several occasions in June, 1909. They were evidently breeding but I was unable to locate the nest.

36. **Recurvirostra americana.** AMERICAN AVOCET.— A regular migrant. Quite common in the Gallatin Valley in August.

37. **Gallinago delicata.** WILSON'S SNIPE.— Summer resident. These birds breed rather commonly in willow swamps in the valleys. During May and June the males may be seen commonly circling through the air and performing their curious wing-notes. Mr. Lea Marston showed me a nest of this species near Sedan. Mr. Thomas saw these birds throughout the winter of 1908–9 in a warm willow swamp near Bozeman.

38. **Pisobia bairdi.** BAIRD'S SANDPIPER.— Recorded from Fort Ellis in the summer of 1875 by Mr. George Bird Grinnell.

39. **Pisobia minutilla.** LEAST SANDPIPER.— Recorded with the above species from Fort Ellis by Mr. Grinnell.

40. **Totanus melanoleucus.** GREATER YELLOW-LEGS.— Richmond and Knowlton recorded this species as common in September.

41. **Totanus flavipes.** YELLOW-LEGS.— Recorded from Fort Ellis in 1875 by Mr. Grinnell.

42. **Helodromas solitarius cinnamomeus.** WESTERN SOLITARY SANDPIPER.— Common migrant in August. I have not noted it in spring.

43. **Catoptrophorus semipalmatus inornatus.** WESTERN WILLET. — A pair noted by Richmond and Knowlton at Moreland, now known as Manhattan, Aug. 19, 1888.

44. **Bartramia longicauda.** UPLAND PLOVER.— Rather rare summer resident. I noted this species near Sedan July 30, 1908, and in the Gallatin Valley, north of Bozeman, July 22, 1909. In the latter case the bird evidently had young near.

45. **Actitis macularia.** SPOTTED SANDPIPER.— Common summer resident. Breeds both in the valleys and along mountain streams to at least 7500 feet. This species arrives about the middle of May and leaves in August or early September.

46. **Numenius americanus.** LONG-BILLED CURLEW.— Summer resident. Breeds abundantly in the Three Forks Valley but occurs rarely and only in migrations in the Gallatin Valley.

47. **Oxyechus vociferus.** KILLDEER.— Common summer resident in the valleys. Prefers cultivated lands about plowed fields and irrigating ditches.

48. **Podasocys montanus.** MOUNTAIN PLOVER.— Mr. Thomas noted this species at Three Forks in June, 1909 when it was evidently breeding.

*49. **Dendragapus obscurus obscurus.** DUSKY GROUSE.

*50. **Dendragapus obscurus richardsoni.** RICHARDSON'S GROUSE. — Gallatin County lies where the range of these two forms meet. Most of the birds are intergrades and not typical of either form. I believe that the larger part of the Gallatin County birds are nearer *obscurus* than *richardsoni*, while further north and west in Montana the reverse is true.

*51. **Bonasa umbellus togata.** CANADA RUFFED GROUSE.— Permanent resident. Abundant in the foothills and in willow and spruce swamps high into the mountains.

*52. **Pediœcetes phasianellus campestris.** PRAIRIE SHARP-TAILED GROUSE.— Resident in the valleys. Richmond and Knowlton found it very common. It is seldom seen now in the Gallatin Valley but occurs in fair numbers in the Three Forks and East Flathead Valleys. A specimen taken near Sedan was considered nearer to this form than to *columbianus* by Dr. Bishop.

53. **Centrocercus urophasianus.** SAGE GROUSE.— Richmond and Knowlton found this species common in the valleys. To-day it occurs, to my knowledge, only in the East Flathead Valley.

54. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Abundant summer resident in the valleys. This bird appears about May 10 and leaves in September. It nests commonly in willow thickets and on the ground in sagebrush land.

55. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Rare summer resident. Seen a few times from April to September. Richmond and Knowlton found it common but it does not appear to be so now.

56. **Circus hudsonius.** MARSH HAWK.— Abundant summer resident in the valleys. The males arrive in the latter part of March and the females a week or two later. They usually breed in willow thickets. In August and September they are very abundant in the Gallatin Valley and leave early in October. I believe this species will be found to be of considerable value to the farmers of the Gallatin Valley because of its destruction of gophers and other small rodents.

57. **Accipiter velox.** SHARP-SHINNED HAWK.— Summer resident in the mountains but much more abundant in the valleys and foothills during migrations. I noted them commonly from Sept. 15 to Oct. 6, 1908, and from May 13–29, 1909.

58. **Accipiter cooperi.** COOPER'S HAWK.— Summer resident in the mountains. I noted this species but twice in the West Gallatin Cañon in July.

*59. **Astur atricapillus.** GOSHAWK.— Rare summer resident in the mountains where Mr. Ginn, a taxidermist in Bozeman, found a nest on Spanish Creek. Common fall migrant and occasional throughout the winter in both valleys and mountains.

*60. **Buteo borealis calurus.** WESTERN RED-TAIL.— Common summer resident, breeding in tall firs in the mountains and foothills. It arrives about the first of April and leaves in the middle of October.

61. **Buteo swainsoni.** SWAINSON'S HAWK.— Summer resident in the valleys, nesting in cottonwood groves. This species appears to be much commoner at lower elevations in the northern part of the county.

62. **Archibuteo lagopus sancti-johannis.**— ROUGH-LEGGED HAWK. — Common winter resident in the valleys. This is the only abundant winter hawk. It appears about Oct. 10 and remains until the middle of April. It feeds largely on gophers and will probably prove to be of value for this reason.

63. **Archibuteo ferrugineous.** FERRUGINOUS ROUGH-LEG.— Summer resident. Not common in the Gallatin Valley but common in the Three Forks and East Flathead Valleys. Mr. Thomas found a nest in a cottonwood grove near Three Forks in June, 1909.

64. **Aquila chrysaëtos.** GOLDEN EAGLE.— Permanent resident. A few pairs breed in the West Gallatin Cañon, and Mr. Thomas found a nest of the species in Bridger Cañon.

65. **Haliæëtus leucocephalus.** BALD EAGLE.— I saw a bird of this species in Middle Creek Cañon Nov. 10, 1908. Mr. Thomas reported another which was captured alive on Maine St., Bozeman, in July, 1909.

66. **Falco mexicanus.** PRAIRIE FALCON.— Summer resident. I have seen this species only at Three Forks but there is a specimen at the Agricultural College which was found dead in the Gallatin Valley near Bozeman.

67. **Falco peregrinus anatum.** DUCK HAWK.— Summer resident. Fairly common from the middle of April until the last of October. Mr. Rheesis Fransham showed me a nest of this species on a limestone cliff on Squaw Creek, in the West Gallatin Cañon.

68. **Falco columbarius richardsoni.** RICHARDSON'S PIGEON HAWK. — Taken on the Madison River by Richmond and Knowlton, Sept. 23, 1888. Mr. Thomas noted this species twice during the summer of 1909 in the mountain cañons south of Bozeman.

*69. **Falco sparverius phalæna.** DESERT SPARROW HAWK.— Abundant summer resident in the valleys and lower mountain cañons. It appears in the latter part of April and leaves in October.

70. **Pandion haliaëtus carolinensis.** OSPREY.— I have seen this species but once, June 13, 1909, near Bozeman. Richmond and Knowlton recorded it as rather common and it is probably more abundant along the larger rivers.

71. **Asio wilsonianus.** LONG-EARED OWL.— Richmond and Knowlton noted this species along the Jefferson River. Mr. Thomas saw some

young birds which some boys had taken from an old crow's nest in a willow thicket near Bozeman.

72. **Asio flammeus.** SHORT-EARED OWL.— Permanent resident in the valleys. This species was particularly abundant in the Gallatin Valley during April, 1909, when it was to be seen on dark days and toward evening, sitting on fence posts along the roads. A farmer in the Gallatin Valley described a nest, evidently of this species, to Mr. Thomas.

73. **Strix varia.** BARRED OWL.— I noted this species in Sour Dough Cañon, Aug. 5, 1909.

74. **Otus asio maxwelliæ.** ROCKY MOUNTAIN SCREECH OWL.— Mr. Thomas heard this species in Bridger Cañon, July 20, 1909.

75. **Bubo virginianus pallescens.** WESTERN HORNED OWL.— Permanent resident in both valleys and mountains.

76. **Nyctea nyctea.** SNOWY OWL.— Seen occasionally in the Gallatin Valley in winter. Said to occur in large numbers some winters.

77. **Glaucidium gnoma.** PYGMY OWL.— Permanent resident in the mountains. I noted this species near Flathead Pass in September, 1908, and in Sour Dough Cañon in January, 1909. Mr. Thomas found a nest containing young in Bridger Cañon in June, 1909.

78. **Ceryle alcyon.** BELTED KINGFISHER.— Common summer resident. This species arrives early in April and leaves in the first part of October. It probably winters occasionally as I noted an individual at Three Forks, Feb. 12, 1910.

79. **Dryobates villosus monticola.** ROCKY MOUNTAIN HAIRY WOODPECKER.— Permanent resident, occurring in the mountains in summer and in cottonwood groves in the valleys in winter. In June, 1909, I located several nests containing young.

80. **Dryobates pubescens homorus.** BATCHELDER'S WOODPECKER. — Permanent resident, occurring in similar places to the above species but much less common.

81. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.— Taken by F. H. Knowlton in the Gallatin Basin, Aug. 29, 1890.

82. **Picoides americanus americanus.** THREE-TOED WOODPECKER.

83. **Picoides americanus dorsalis.** ALPINE THREE-TOED WOODPECKER.— This species is a permanent resident in the mountains. I believe that birds referable to both forms may be found. A male bird in the collection at the Agricultural College, taken in Bear Cañon has very little white on the back while the birds I have observed have so much white that it is difficult to distinguish the female from Batchelder's Woodpecker in the field. In June, 1909, I watched a pair of these birds excavating their nest on Middle Creek. The male bird did most of the work of excavation. This nest was deserted before the eggs were laid.

84. **Sphyrapicus varius nuchalis.** RED-NAPED SAPSUCKER.— A common summer resident in the foothills and mountains breeding in aspen groves. In July, 1909, I found a nest of this species containing young on the West Fork. About two feet below the entrance to this nest was an older hole which was occupied by a family of red squirrels.

85. **Sphyrapicus thyroideus.** WILLIAMSON'S SAPSUCKER.— Taken by F. H. Knowlton in the Gallatin Basin. Thomas found a nest of this species in Bridger Cañon.

86. **Melanerpes erythrocephalus.** RED-HEADED WOODPECKER.— A male of this species, taken in the mountains south of Bozeman, is in the collection at the Agricultural College.

87. **Asyndesmus lewisi.**— LEWIS'S WOODPECKER.— Common summer resident in the foothills and valleys arriving early in May. I found two nests of this species in dead cottonwoods near Salesville.

88. **Colaptes auratus luteus.** NORTHERN FLICKER.

89. **Colaptes cafer collaris.** RED-SHAFTED FLICKER.— Birds referable to both of these species occurs but the large majority of birds are hybrids. They arrive early in April and leave about November 1. A few winter in the vicinity of Lombard.

90. **Phalænoptila nuttalli.** POOR-WILL.— I found this species in the foothills near Lyman Creek July 20 and 21, 1909, and secured a specimen on July 21.

91. **Chordeiles virginianus henryi.** WESTERN NIGHTHAWK.— Abundant summer resident, arriving about the second week in June and leaving late in August. During July, 1909, I found young on several occasions in sagebrush land.

92. **Selasphorus rufus.** RUFOUS HUMMINGBIRD.— Summer resident. Mr. Rheesis Fransham showed me a nest of this speies on Squaw Creek.

93. **Stellula calliope.** CALLIOPE HUMMINGBIRD.— An immature bird was taken by F. H. Knowlton, Aug. 12, 1890. An adult male from Squaw Creek is in the collection at the Agricultural College. I have not met this species in Gallatin County but secured an adult male near Cokedale, Park County, on May 29, 1909.

94. **Tyrannus tyrannus.** KINGBIRD.— Common summer resident in the valleys. This bird nests abundantly in the cottonwood trees in Bozeman. It arrives about May 20, and leaves the last of August.

95. **Tyrannus verticalis.** ARKANSAS KINGBIRD.— Summer resident in the valleys but less common than the above species. This species arrives about a week later than the common Kingbird and departs somewhat earlier.

96. **Sayornis sayus.** SAY'S PHŒBE.— Two specimens taken by Richmond and Knowlton. I know of no other records of this species. It is probably rare in most parts of the county.

97. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.— Summer resident in the mountains. This species is well distributed but not common. It frequents open fir forests and appears to prefer trees that are spike topped and partially dead. It is occasionally seen in the valleys during migrations.

98. **Myiochanes richardsoni.** WESTERN WOOD PEWEE.— Summer

[1] See The Condor, Vol. XI, pp. 197.

resident in cottonwood groves in the valleys. Very abundant in Bozeman. This species arrives about June 10, and leaves early in September.

99. **Empidonax trailli trailli**. TRAILL'S FLYCATCHER.

*100. **Empidonax trailli alnorum.** ALDER FLYCATCHER.— This species is a rather rare summer resident in willow and alder thickets along mountain streams. I believe that specimens referable to both of the above forms will be found to occur. A specimen taken on Brackett Creek on May 21, 1909, proved rather puzzling as it is almost an exact intergrade, but was finally referred to *alnorum* by Dr. Bishop.

101. **Empidonax minimus.** LEAST FLYCATCHER.— Summer resident in the valleys. So far I have only met this species in the cottonwood trees in Bozeman where it is quite abundant. It appears in the latter part of May and leaves again in August.

102. **Empidonax hammondi.** HAMMOND'S FLYCATCHER.—Summer resident in the mountains, frequenting willow and alder thickets along streams and the edges of mountain parks. I found a nest of this species in Sour Dough Cañon, July 2, 1909.

103. **Empidonax wrighti.** WRIGHT'S FLYCATCHER.— Common summer resident in the foothills, frequenting aspen groves and clumps of young fir. It arrives in the latter part of May.

104. **Otocoris alpestris leucolæma**.— DESERT HORNED LARK.— Abundant summer resident in the Three Forks Valley but only locally common during the breeding season in the Gallatin Valley. This bird prefers grazing land and rolling grassy hills, rather than agricultural districts. This species arrives very early in March and its flocks are usually the first sign of the spring migration. It leaves in late November and a few remain about Three Forks, in company with the next form, throughout the winter.

*105. **Otocoris alpestris arcticola.** PALLID HORNED LARK.— Common winter resident in the valleys, arriving in December and leaving in February or early March.

106. **Pica pica hudsonia.** MAGPIE.— Abundant permanent resident, nesting in willow thickets in the valleys and in thorn-bushes and aspen groves in the foothills. They begin nesting in April or May and the first young are to be seen by the last of May. In the fall they may often be seen in the mountains as high as 8,000 feet.

*107. **Cyanocitta stelleri annectens.** BLACK-HEADED JAY.— Permanent resident in the mountains, being usually more common in fir than in pine forests. In the winter they stay about cabins and lumber camps in company with Rocky Mountain Jays and Nutcrackers. In October I have occasionally seen them in the valleys in willow thickets.

*108. **Perisoreus canadensis capitalis.** ROCKY MOUNTAIN JAY.— Permanent resident in the mountains, and seen most commonly about lumber camps and cabins when they are quite tame.

109. **Corvus corax sinuatus.** WESTERN RAVEN.— I saw a raven about Ramshorn Peak in the Gallatin Range at an elevation of 9,000 feet on Oct. 29, 1908.

*110. **Corvus brachyrhynchos hesperis.** WESTERN CROW.— Common summer resident, nesting in willow thickets in the valleys. Richmond and Knowlton noted a crow roost in the mountains south of Fort Ellis. So far as I know, this roost does not exist at present, perhaps because a large amount of timber has been removed from this vicinity since then. Crows are among the earliest migrants, arriving in late March and leaving in October. A few remain in the vicinity of Bozeman throughout the winter.

111. **Nucifraga columbiana.** CLARK'S NUTCRACKER.— Permanent resident in the mountains, occurring most commonly in the alpine forests but not uncommon as low as 6,000 feet in open stands of Douglas fir. Mr. A. M. Pyfer found this species nesting near Salesville in March.

112. **Dolichonyx oryzivorus.** BOBOLINK.— Common summer resident in the valleys. Richmond and Knowlton found it in but one place in the Gallatin Valley, which shows a recent increase in the species, since it is now found in many places throughout this valley. It arrives about the middle of May and leaves in late August.

113. **Molothrus ater.** COWBIRD.— Common summer resident, arriving in the second week in May. I have found their eggs more often in the nest of Brewer's Blackbird than any other species. Mr. Thomas found the eggs and young quite commonly in the nest of the Slate-colored Sparrow.

114. **Xanthocephalus xanthocephalus.** YELLOW-HEADED BLACKBIRD.— Common summer resident about Three Forks but, so far as I know, not found in the Gallatin Valley, probably because of the lack of suitable breeding grounds.

*115. **Agelaius phœniceus fortis.** THICK-BILLED RED-WING.— Summer resident, but not common because of the lack of suitable localities. A small colony nests just south of Bozeman and another in the East Flathead Valley, the latter in willow bushes with a company of Brewer's Blackbirds. This species arrives in April and leaves in October or later. I secured two birds on Dec. 9, 1908, in the East Flathead Valley about on the border line of Park and Gallatin counties.

116. **Sturnella neglecta.** WESTERN MEADOWLARK.— Abundant summer resident in the valleys. This species appears about the middle of March and leaves in November. A few spend the winter in the grainfields of the Gallatin Valley.

117. **Icterus bullocki.** BULLOCK'S ORIOLE.— Rare summer resident. Mr. Thomas saw one of these birds in Bozeman in August, 1909. There is an adult female, taken in the Gallatin Valley, in the collection at the Agricultural College. It will perhaps be found to be more common along the upper Missouri as I noted several old nests at Lombard in February, 1910.

118. **Euphagus cyanocephalus.** BREWER'S BLACKBIRD.— Common summer resident in the valleys, nesting in colonies in the willow thickets and wild-rose bushes. They arrive in April and leave in October. A large percentage of their nests contains Cowbird's eggs.

119. **Quiscalus quiscula æneus.** BRONZED GRACKLE.— Rare summer resident. There is a mounted specimen of this bird in the collection at the Agricultural College which was taken on the college grounds in Bozeman. Mr. Thomas found a pair evidently nesting in a willow thicket near Bozeman, and Mr. Wyatt Jones told me that they were fairly common in the vicinity of Belgrade.

*120. **Hesperiphona vespertina montana.** WESTERN EVENING GROSBEAK.— Regular migrant. Flocks of these birds may be seen in cottonwood groves and willow thickets in spring and fall. They appear in March and are common until April 10. I saw a single male as late as May 8, 1909. The fall migration occurs in October and November, when they are sometimes seen in Bozeman feeding on Box Elder seeds.

*121. **Pinicola enucleator montana.** ROCKY MOUNTAIN GROSBEAK.— Summer resident in the higher mountains and migrant in the valleys. It appears in the valleys about the middle of October and is fairly abundant in the willow thickets for a time. It is most abundant in spring in April and a few remain until early May. A few may winter but I believe that most if not all of the winter birds belong to the next form. The type specimens, from which this form was first described by Ridgway, came from this region.

*122. **Pinicola enucleator alascensis.** ALASKAN PINE GROSBEAK.— Two birds taken Dec. 21, 1908, were referred to this form by Dr. Bishop. I have noticed a break in the abundance of Pine Grosbeaks in the first part of November and the last part of March which leads me to believe that this is the common winter form and that this break occurs when the summer form is leaving and the winter birds have not yet arrived and *vice-versa*.

123. **Carpodacus cassini.** CASSIN'S PURPLE FINCH.— Summer resident, arriving early in May and breeding in the fir forests in the mountains and occasionally in cottonwood groves in the valleys. It is not uncommon in Bozeman throughout the breeding season.

124. **Loxia curvirostra minor.** CROSSBILL.— Migrant in the mountains. I saw flocks of this species from Sept. 23 to Oct. 24, 1908, and on May 19, 1909. I have not noted it during the breeding season.

*125. **Leucosticte tephrocotis.** GRAY-CROWNED ROSY FINCH.— Migrant and winter resident. This bird appears to be very irregular in its occurrence. I noted it in the Gallatin Mountains in October. During the winter it was usually quite rare but became very common in the Gallatin Valley for a short time during April and early May. Though seldom seen in this region, when it is observed it is always in large flocks.

*126. **Leucosticte tephrocotis littoralis.** HEPBURN'S ROSY FINCH. —I found several Gallatin County specimens of this form in the collection at the Agricultural College. It undoubtedly occurs with flocks of the above form.

127. **Acanthis linaria.** REDPOLL.— Abundant winter resident. This bird first appears in September, becomes quite common by the middle

of October and in winter is probably the most abundant of all species. In spring I noted it in small numbers up to May 20, 1909.

*128. **Astragalinus tristis.** GOLDFINCH.— Common summer resident in willow thickets in the valleys. It occasionally winters in small flocks. A bird secured at Three Forks in February, 1910, was identified as *A. t. tristis* by Dr. Bishop although *A. t. pallidus* should occur and perhaps will be found to be the common breeding form in this region.

129. **Spinus pinus.** PINE SISKIN.— Abundant summer resident. This species arrives in May and breeds in cottonwood groves in the valleys and lower mountain cañons and in the mountain forests as high as 8,000 feet. I found a nest of this species in middle Creek Cañon placed in a willow three feet from the ground. This nest was partially completed on June 21, and contained three eggs by June 26. Mr. Thomas found several nests in cottonwood trees and young firs in Bozeman. One of these contained four fully fledged young on Aug. 20, 1909. This species leaves in the middle of September.

130. **Passer domesticus.** ENGLISH SPARROW.— This bird is now quite common in all towns and settlements along the railroads. It arrived some time in the last ten years but I have been unable to get exact data.

131. **Plectrophenax nivalis.** SNOW BUNTING.— Mentioned as occurring in winter at Salesville, by Mr. A. M. Pyfer.

132. **Calcarius lapponicus.** LAPLAND LONGSPUR.— I noticed large flocks of this species on March 30 and April 1 and 17, 1909. It probably occurs regularly in migrations and perhaps in winter.

133. **Pœcetes gramineus confinis.** WESTERN VESPER SPARROW.— Common summer resident. This species arrives late in April and leaves the last of September. It is a very common bird in the cultivated parts of the Gallatin Valley and even commoner in the sagebrush land of the East Flathead Valley. I found young of this species out of the nest and barely able to fly on July 22, and probably a second brood nest, containing fresh eggs on July 27.

*134. **Passerculus sandwichensis alaudinus.** WESTERN SAVANNAH SPARROW.— Common summer resident in the valleys, arriving about the middle of May.

135. **Ammodramus savannarum bimaculatus.** WESTERN GRASSHOPPER SPARROW.— Summer resident in the valleys. Quite rare in the Gallatin Valley but fairly common about Three Forks.

*136. **Chondestes grammacus strigatus.** WESTERN LARK SPARROW. — Richmond and Knowlton obtained specimens of this bird. I have observed it but once, on July 7, 1909, in a thicket of tall sage-brush and greasewood near Lombard.

137. **Zonotrichia leucophrys.** WHITE-CROWNED SPARROW.— Common summer resident. This species breeds in willow thickets, both in the valleys about Bozeman and in the mountain cañons up to 8,000 feet. It arrives early in May, in company with the next form, and leaves about

the middle of October. Mr. Thomas found a nest of this species near Bozeman in June and I discovered one on June 25 on Middle Creek, at an elevation of 7,100 feet.

*138. **Zonotrichia leucophrys gambeli.** INTERMEDIATE SPARROW.— Abundant migrant in May and in September and October. Richmond and Knowlton stated that this form breeds in the mountains. They did not state that any summer birds were taken, and since they did not record the above form, I believe they must have mistaken it for this one. I have never taken the form *leucophrys*, but have examined many birds closely in the field and have never found *gambeli* in either valleys or mountains in summer. At the Middle Creek nest mentioned above I was able to examine the sitting female from a few feet distance and feel certain of her identity.

*139. **Spizella monticola ochracea.** WESTERN TREE SPARROW.— Common winter resident in the valleys, particularly in willow thickets. It arrives late in September and leaves late in April.

140. **Spizella passerina arizonæ.** WESTERN CHIPPING SPARROW.— Common summer resident. This species occurs in the valleys in cottonwood groves and in the mountains, about the edges of mountain parks, as high as 8,000 feet. It is quite common in Bozeman and arrives about the middle of May and leaves in September.

141. **Spizella breweri.** BREWER'S SPARROW.— Richmond and Knowlton found this species commonly. I noted it but once, in the East Flathead Valley on July 28, 1909, when I saw both adults and a young bird just out of the nest.

*142. **Junco hyemalis.** SLATE-COLORED JUNCO.— Abundant migrant from the middle of September till November and from the middle of April to the middle of May. I estimated that about 10 to 20 % of the flocks of migrant Juncos were of this form.

*143. **Junco hyemalis shufeldti.** SHUFELDT'S JUNCO.— Abundant migrant. This is usually the first Junco to arrive in spring, appearing about April 1 and remaining till early in May. It is also later than the other subspecies in fall, occurring from early October to the middle of November. It usually forms 30 to 40 % of the migrant flocks but occasionally flocks are almost entirely of this form.

*144. **Junco hyemalis montanus.** MONTANA JUNCO.— A regular migrant in flocks with the other Juncos. Since it is more difficult to distinguish in the field than the other forms I have few notes as to its relative abundance.

*145. **Junco hyemalis mearnsi.** PINK-SIDED JUNCO.— Common summer resident in the mountains and usually the most abundant of the migrant Juncos, forming from 50 to 100 % of the flocks. This form arrives in April and leaves in late October. In summer it occurs from 6,000 to 8,000 feet in open woods and about the edges of mountain parks. I found a nest in the Bridger Mountains, containing partially incubated eggs, on July 19, 1908.

146. **Amphispiza nevadensis.** SAGE SPARROW.— An abundant summer resident in the East Flathead Valley. The only other place that I have found it is in the Gallatin Basin where I heard several birds singing in July.

*147. **Melospiza melodia montana.** MOUNTAIN SONG SPARROW.— Abundant summer resident in willow thickets in the valleys and along mountain streams to at least 7,500 feet. It is also quite a common winter resident as high as 6,500 feet. The spring song period begins very early so that it is impossible to distinguish migrants from winter residents with certainty. The spring migrants, however, evidently arrive by April 1, if not sooner.

148. **Melospiza lincolni.** LINCOLN'S SPARROW.— An abundant summer resident in willow thickets in the mountains, above 6,500 feet. It arrives early in June, occurring in the valleys, in small numbers, for a few days. The fall migration apparently begins early, for I have found it in the valleys again by July 30. It remains until early September.

*149. **Passerella iliaca schistacea.** SLATE-COLORED FOX SPARROW.— Abundant summer resident in willow thickets in the valleys, arriving early in April. It prefers the thickest and most impenetrable of the willow thickets. For this reason it is more often heard than seen, and I have no records of its occurrence after July 10, when the song period ceases.

150. **Pipilo maculatus arcticus.** ARCTIC TOWHEE.— Abundant summer resident in thickets of willow, wild-rose and thorn in the valleys and foothills. It arrives in the middle of May and leaves by the middle of September.

151. **Oreospiza chlorura.** GREEN-TAILED TOWHEE.— Summer resident in the foothills in wild-rose and thorn thickets. It arrives in the latter part of May. It is much less common than the above species, though usually found in company with it.

152. **Zamelodia ludoviciana.** ROSE-BREASTED GROSBEAK.— Mr. Thomas observed a male of this species on Church St., Bozeman, on two different occasions in June and July, 1909. On the first occasion it was in company with a male of the next species.

153. **Zamelodia melanocephala.** BLACK-HEADED GROSBEAK.— Summer resident in the valleys, inhabiting the willow thickets. I have not seen this species in the East Flathead Valley nor in the other valleys above 5,000 feet. It arrives late in May.

154. **Passerina amœna.** LAZULI BUNTING.— Common summer resident, inhabiting wild-rose thickets in the valleys and foothills. Arrives in the latter part of May and leaves in August.

155. **Calamospiza melanocorys**. LARK BUNTING.— Summer resident. I noted only a few individuals of this species during the spring migration from May 24 to June 13, 1909. Mr. Thomas found it breeding commonly at Three Forks and Prof. Cooley told me that in 1907 it appeared in large numbers and bred throughout the Gallatin Valley, but that he had not seen it since then.

156. **Piranga ludoviciana**. WESTERN TANAGER.— Summer resident in the mountains, appearing to have a decided preference for fir forests, as I have only noted it in this type. It arrives early in June and occurs for a short time in cottonwood groves in the valleys. I have not noted it later than Aug. 3.

157. **Progne subis.** PURPLE MARTIN.— Both Mr. Thomas and I noted this species in Bozeman during June and July. I believe that they were breeding somewhere in the northwestern quarter of the town, but we were unable to locate the spot.

158. **Petrochelidon lunifrons.** CLIFF SWALLOW.— Common summer resident. Very abundant in the Gallatin Valley, nesting under the eaves of buildings. A few large colonies breed on cliffs along the Missouri and Gallatin Rivers near Logan and Lombard. Arrives early in June and leaves in August.

159. **Hirundo erythrogastra**. BARN SWALLOW.— Common summer resident. Abundant in the Gallatin Valley, where I found it breeding under low bridges over irrigating ditches about as commonly as in barns. This species arrives in the latter part of May and leaves late in August.

160. **Iridoprocne bicolor.** TREE SWALLOW.— Summer resident, but more common in migrations. Richmond and Knowlton found a colony breeding in a clump of cottonwood trees. I have noted it in the breeding season but once, when a single pair had a nest in a building in the busiest part of Main St., Bozeman. The birds were not there in 1909 and the site was occupied by English Sparrows. This species arrives early in May and leaves in September.

161. **Tachycineta thalassina lepida.** NORTHERN VIOLET-GREEN SWALLOW.— Common summer resident, breeding in limestone cliffs in the lower mountain cañons, below 6,000 feet. Colonies occur in the cañons of Sixteen Mile and Bridger Creeks and the Gallatin River. This species arrives about the middle of May and leaves late in August.

162. **Riparia riparia**. BANK SWALLOW.— Summer resident, but not common. There are breeding colonies in banks along the East Gallatin River and Bridger Creek.

163. **Stelgidopteryx serripennis**. ROUGH-WINGED SWALLOW.— Common summer resident. This species breeds commonly throughout the valleys, usually with but a single pair in a locality. They arrive about May 20 and leave late in August.

164. **Bombycilla garrula.** BOHEMIAN WAXWING.— Common winter resident. This species arrives in the mountains in the last of October and is seen in the valleys a few weeks later. Flocks occur all winter both in valleys and in the mountains as high as 7,000 feet. In midwinter they often visit Bozeman in large numbers and strip the mountain ash trees of their berries. In the mountains they feed on cedar, juniper and bearberry. They leave in spring about the last of April.

165. **Bombycilla cedrorum.** CEDAR WAXWING.— Summer resident. This species arrives later than most others, being noted first on

June 18, 1909. I saw it but once in 1908, but it was very common in 1909, when I found two nests in the shade trees of Bozeman in August. I believe that this difference in abundance was due to the relative abundance of service-berries, which form a large portion of the food of the young.

166. **Lanius borealis.** NORTHERN SHRIKE.— Common winter resident in the valleys. This species arrives early in October and leaves by the last of March. I have seen it in mountain parks as high as 7,000 feet in November. An adult male, taken at Three Forks in February, 1910, had the typical measurements and markings of the form described as *L. b. invictus*. Should this form be accepted as a subspecies it should be included in the list of Gallatin County birds.

167. **Lanius ludovicianus excubitorides.** WHITE-RUMPED SHRIKE. — Summer resident. Richmond and Knowlton recorded it as common in the valleys. I have not seen it in summer but noted it quite commonly from May 2–15, 1909.

168. **Vireosylva olivacea.** RED-EYED VIREO.— Summer resident in cottonwood groves in the valleys. Not common. I have noted it near Logan and on a small island in the Gallatin River near Salesville. During migrations in late August I have occasionally seen it in Bozeman.

169. **Vireosylva gilva swainsoni.** WESTERN WARBLING VIREO.— Common summer resident in cottonwood groves in the valleys and about the edges of mountain parks to 7,500 feet. It arrives in the latter part of May and leaves late in August. It is quite common in the shade trees of Bozeman, where it builds beautiful nests, using cottonwood down largely in the construction.

170. **Vermivora celata lutescens.** LUTESCENT WARBLER.— Migrant. This bird was quite common in the valleys and foothills from May 8 to June 2, 1909.

171. **Dendroica æstiva.** YELLOW WARBLER.— Common summer resident in willow thickets in the valleys. This species arrives about May 20 and leaves late in August.

172. **Dendroica auduboni.** AUDUBON'S WARBLER.— Common summer resident in the mountains. This species is abundant in the foothills during migrations. It first appears early in May and leaves about the middle of October.

173. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH.— Summer resident. Not common. A few of these birds may be found throughout the summer in the willow swamps near Bozeman. They arrive about the end of May.

174. **Oporornis tolmiei.** MACGILLIVRAY'S WARBLER.— Common summer resident in willow and wild-rose thickets in the valleys and foothills. It arrives late in May.

175. **Geothlypis trichas occidentalis.** WESTERN YELLOW-THROAT. — Common summer resident in similar places to the above species but somewhat more abundant. Arrives about May 20.

176. **Wilsonia pusilla pileolata.** PILEOLATED WARBLER.— Common

summer resident in willow thickets in the mountains above 7,000 feet. This species arrives early in June and departs in September. During migrations it is quite abundant for a short time in the valleys.

177. **Setophaga ruticilla**. REDSTART.— Summer resident in cottonwoods, willows and alders in the valleys and in the lower mountain cañons. It arrives late in May and is not common.

178. **Anthus rubescens.** PIPIT.— Common fall migrant, appearing in the valleys about the middle of September and remaining until the latter part of October. It is often in company with Horned Larks. I have not seen this species in spring.

179. **Cinclus mexicanus unicolor.** DIPPER.— Permanent resident in the mountain cañons. In winter I have occasionally seen these birds near Bozeman on Bozeman Creek and the East Gallatin River, but only in places where the water runs swiftly. Most of them remain in the mountain cañons all winter where they sing better and more frequently in February and March than at any other time of year. In 1909 I found four nests of this species placed on beams of bridges, and this seems to be a very common location for them in this region. Out of eight nests found, only one was placed in the traditional location, beside a waterfall where the spray kept the moss fresh. The rest were on bridges, on rocks above the water, and one in the beams of a splash dam. In the latter case the dam was in use when the birds were building and was opened and closed twice a day so that the water sometimes flowed over the top and sometimes through at the bottom. The birds attempted to build as close to the water as possible and thus had two locations for their nest. The water, however, kept removing the material from the lower site so that the upper nest was finally completed and occupied.

180. **Oreoscoptes montanus.** SAGE THRASHER.— I found this bird in the East Flathead Valley on June 8, 1909. Richmond and Knowlton noted it in the Gallatin Valley and secured a specimen. Like the other sagebrush species it has probably entirely disappeared from the Gallatin Valley since then.

181. **Dumetella carolinensis**. CATBIRD.— Common summer resident in the willow thickets in the valleys. It arrives late in May and leaves about the 10th of September.

182. **Salpinctes obsoletus**. ROCK WREN.— Summer resident. This bird is quite common in the limestone rocks of the northern part of the county, occurring along the Missouri River and on Sixteen Mile Creek and its branches. I have not found it in other parts of the county. I believe that the reason for this is the character of the country rather than the elevation, because it occurs at much higher elevations in neighboring counties.

183. **Troglodytes aëdon parkmani**. WESTERN HOUSE WREN.— Summer resident but not common. This species arrives about May 20 and nests about buildings in the valleys.

184. **Cistothorus stellaris.** SHORT-BILLED MARSH WREN.— I ob-

served a bird of this species in a clump of tall grass along the Missouri River at Lombard on April 22, 1909.

*185. **Certhia familiaris montana.** ROCKY MOUNTAIN CREEPER.— A rare summer resident in spruce forests in the mountains. Seen more often during migrations but by no means common then. The migrating birds were noted from Sept. 11 to Nov. 10, 1908, and from March 25 to April 16, 1909. I observed it once in winter near Ross's Peak, Feb. 17, 1909.

186. **Sitta carolinensis nelsoni.** ROCKY MOUNTAIN NUTHATCH.— Rare but probably permanent resident. Richmond and Knowlton found it breeding. I noted it but twice, Sept. 28, 1908, and Feb. 27, 1909.

187. **Sitta canadensis.** RED-BREASTED NUTHATCH.— Migrant. Quite common in fall. Noted from Sept. 7 to Oct. 24, 1908, and from April 16 to May 25, 1909.

*188. **Penthestes atricapillus.** CHICKADEE.— A Chickadee, taken at Bozeman, Nov. 26, 1908, was identified as *P. a. atricapillus* by Dr. Bishop. This bird had the breast stained dark gray, a common occurrence among winter Chickadees in this region and said to be caused by living in burned timber. Since there are no large bodies of burned timber in this region it is apparent that they migrate from elsewhere. Thinking that all the dark-breasted birds might belong to this form I secured another at Three Forks in February, 1910. This bird, however, proved to be the usual form, *P. a. septentrionalis.*

*189. **Penthestes atricapillus septentrionalis.** LONG-TAILED CHICKADEE.— Abundant permanent resident in willow thickets in the valleys and mountain cañons to about 6,500 feet.

190. **Penthestes gambeli.** MOUNTAIN CHICKADEE.— Permanent resident in the mountains. In October it may be seen occasionally in the valleys with the above species.

*191. **Regulus satrapa olivaceus.** WESTERN GOLDEN-CROWNED KINGLET.— Abundant migrant and rather uncommon summer resident in spruce forests in the mountains. Occasional as a winter resident in company with Mountain Chickadees.

192. **Regulus calendula.** RUBY-CROWNED KINGLET.— Common summer resident in the mountains. In migrations this species occurs in willows in the valleys but in the breeding season is found only in forests of Douglas fir. The song of this species in this region is quite different from that of eastern Kinglets. The first two parts are much alike but in the last part, in place of the triplets of the eastern bird, there are a series of double notes on the same pitch, the first note of each double accented. When only the last part of the song is rendered, as is frequently the case, it closely resembles a common call of the Tufted Titmouse.

193. **Myadestes townsendi.** TOWNSEND'S SOLITAIRE.— Summer resident in the mountains but more common during migrations. It does not breed below 7,000 feet to my knowledge, but during migrations is common in the foothills and lower forests. It appears to sing better and more

frequently during the fall than at any other time. It winters rarely in the mountains and quite commonly among the rocky cliffs about Lombard.

194. **Hylocichla fuscescens salicicola.** WILLOW THRUSH.—Common summer resident in willow thickets in the valleys. It arrives late in May and leaves in August.

*195. **Hylocichla ustulata swainsoni.** OLIVE-BACKED THRUSH.—Common summer resident in the mountains, arriving about June 1 and leaving early in September. Occurs regularly in the valleys during migrations.

196. **Hylocichla guttata auduboni.** AUDUBON'S HERMIT THRUSH.—Summer resident in the mountains. Quite rare and usually above 7,000 feet.

*197. **Planesticus migratoria propinqua.** WESTERN ROBIN.—Common summer resident, occurring in valleys and mountains up to 8,000 feet. This species arrives in the middle of March and leaves late in October. It winters rarely. I observed one at Three Forks, Feb. 12, 1910.

198. **Sialia currucoides.** MOUNTAIN BLUEBIRD.—Common summer resident in the valleys and lower mountain peaks below 6,500 feet. This species arrives early in March and leaves in November.

THE PASSENGER PIGEON INVESTIGATION.[1]

BY C. F. HODGE.

AT THE meeting of this Union a year ago a plan was projected and has since been developed to secure adequate search of the American continent for this lost species. If any consider this a "fool's errand," I may add that at that time I put the question fairly to the Union as a body and to a number of you personally: "Do you think that scientifically adequate search has been made for *Ectopistes migratorius*?" Not a decisive affirmative answer was offered, and, among others, Dr. C. Hart Merriam replied distinctly that he did not.

[1] Read at the meeting of the American Ornithologists' Union held in Washington, D. C., Nov. 14–17, 1910.

The plan is familiar to you all, but one or two points in it require restatement and emphasis. Up to that time rewards were in the field, offered, we may be pardoned for supposing, by good men with a healthy dash of Irish blood in their veins, for a freshly killed pigeon to prove that the species was still alive. I pointed out the "bull" to the effect that even a flock of pigeons, flying rapidly over the country as they do, might be wiped out, each observer taking a single bird.

The new plan called for discovery and confidential and exclusive notification of undisturbed nesting pairs or colonies. Just on this point the newspapers have not been as careful as they should in stating that the rewards were offered for "nests." In consequence, of course, nests, fortunately of Mourning Doves, began coming to me by express. If the reporter was a bit more careful and said "*undisturbed nests,*" I received notification of "undisturbed nests" deserted, the birds having reared their young and moved on.

Since the investigation is undertaken solely with the purpose of discovering breeding pigeons *in time* to secure to them absolute protection, no such claim, however meritorious, could be treated as valid. The newspapers have contributed good service to the cause by disseminating notices, but, with three or four notable exceptions, the service might have been far greater, if their reporters had been clear-headed enough to have grasped this essential purpose of the investigation. The investigation is in reality "news" for the American continent — "bad news" if no pigeons can be discovered, "good news" if they are found; and I have endeavored to furnish the papers accurate information as to progress of the search. I must, however, bespeak added care in stating the one essential point that all rewards are offered for information of undisturbed *nesting pairs or colonies* — occupied nestings — of Passenger Pigeons. Not a reward can be paid for anything else.

I also regret to add that some confusion, delay, and possible annoyance has been caused by many papers failing to state to whom information is to be sent. In this way the editor of 'The Auk,' members of the Smithsonian Institution and Department of Agriculture have been caused additional correspondence. I wish to thank all who have helped thus far and to say that I hope

no such confusion will be permitted to occur in future. With such large money prizes involved, it is necessary that one person assume all ultimate responsibility.

It was, of course, expected a year ago that one season's search would settle the matter definitely one way or the other. However, negative evidence is proverbially inconclusive. I have to show you two nests — I might have brought many more — of the Mourning Dove and one nest of probably a Sharp-shinned or Pigeon Hawk, some Mourning Dove feathers and wings, but not a nest or even a feather of the long lost *Ectopistes migratorius.* Not an award has been successfully claimed. What is the reason or sense in prolonging the misery?

In the first place I find myself in the position of the man who was holding the bear. He could not let go. No time limit has been set in any of our announcements so that, in order to keep faith with the public, we must let the awards stand for at least one more season. With a full year's notice, it may be advisable to print in our next announcement that the investigation is to close definitely on October 1, 1911, and that all offers of rewards not claimed by that date will be called off. With the general stirring up the matter has had this year, the observations of another season ought to settle the case for all time.

Although we have no tangible evidence to show, the testimony for the season is greater in amount than for any one year since 1900. After sorting out the season's correspondence I have as possibly true for pigeons seen during 1909 and 1910 reports as follows: From Ontario, 10; from Pennsylvania, 9; from Massachusetts, 8; from New York, 4; from Michigan, 3; from Iowa, 2; and from Illinois, Nebraska, Wisconsin, Minnesota, Connecticut, New Hampshire and Manitoba, 1 each. As a last hope it was thought that these reports might be made to support one another by indicating, when plotted on a map, a consistent course of one or more flocks of pigeons migrating over the continent. So few of these reports, however, give definite data as to number in flock or direction of flight that even this slight hope finds little or no support. The absence of any definite word from reputable naturalists or ornithologists, American or Canadian, is another extremely discouraging and ominous feature of this season's investigation.

Thus what on the surface appear to be the most encouraging reports, in which flocks of hundreds or even thousands of the pigeons have been seen, forfeit all credence on account of their isolation. If, as one report states, the pigeons were nesting in "almost countless numbers" — somewhere in northern United States or Canada (I do not wish to know where until informant is able to report occupied nestings) during the present season, it seems utterly incredible that, in flying to or from their roost, either in feeding or in migrations, they should not have been seen by many others. Another discouraging feature of this year's work is the total absence of reports from the Southern States. If flocks of pigeons are in existence, they ought to be most easily and frequently observed in their southern winter range. Except for unlikely reports from the mountains of western Texas, the Southland has been one vast silence the entire season.

It now looks as if the worst fears of American naturalists were about to be confirmed and that we are "in at the death" of the finest race of pigeons the world has produced.

In the campaign of next season it is proposed to appeal especially to the students and school children, college and university, high school and public school, of this country and Canada, making it thus distinctively educational. Then the awakening to the problem, the bird study necessary to enable one to identify pigeons, if discovered, the wholesome field work will each be worth vastly more to the country at large than the mere cost of this investigation, even if no pigeons are discovered. A number of other valuable species demand united and effective protection, if they are to be saved from extermination.

My own personal expense for postage, printing, office supplies and stationary and for trips to investigate claims has been a little over $100. I said a year ago that I would willingly give this amount to see a live Wild Pigeon or even to be practically assured that the species is extinct. I am willing to renew this sacrifice for one more season. The only other men who have been put to serious expense in this work are Charles K. and Chester A. Reed of Worcester, who have spent $400 on the colored plate and leaflet which has been widely circulated. My grateful acknowledgments are also due to Mr. Dutcher and the National Associa-

tion of Audubon Societies for preparation of the colored plates of the Passenger Pigeon and Mourning Dove. It is to be hoped that renewed effort for another year may result in what may be generally considered an adequate search of the continent for *Ectopistes migratorius*.

CLARK UNIVERSITY, WORCESTER, MASS.

A DESCRIPTION OF THE WILD PIGEONS WHICH VISIT THE SOUTHERN ENGLISH COLONIES IN NORTH AMERICA, DURING CERTAIN YEARS, IN INCREDIBLE MULTITUDES.

BY PEHR KALM.[1]

Translated by S. M. Gronberger.

IN North America there is a species of wild Pigeons which, coming from the upper part of the country, visits Pennsylvania and others of the Southern English settlements during some years, and in marvelous multitudes.

They have, however, already been described and exceedingly well illustrated in lively colors by the two great ornithologists and matchless masters of bird-drawing, Catesby and Edwards; but as I have had occasion to notice with regard to the description proper and especially as regards the living habits of these Pigeons various things which these gentlemen have either left entirely unmentioned, or which at their places of residence they have not been able properly to ascertain, it is my desire to deliver a short account of this subject before the Royal Academy of Sciences, using the notes from my American Diary.

The *names* given by ornithologists to these Pigeons are as follows:

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[1] Translated from Kongl. Vetenskaps-Akademiens Handlingar, för ar 1759, Vol. XX. Stockholm, 1759.

See also explanatory comment by Dr. Theodore Gill respecting this account of the Passenger Pigeon by Kalm, under 'General Notes' (*postea* p. 110).— EDD.

Columba (*macroura*) cauda cuneiformi longa, pectore purpurascente. Linn. Syst. X, T. I, p. 164.

Columba macroura. The long-tailed Dove. Edwards' *History of Birds*, T. I, p. 15, t. 15.

Palumbus migratorius. The Pigeon of Passage. Catesby's *Nat. Hist. of Carolina*, Vol. I, p. 23, t. 23.

Dufvor, Villa Dufvor [Pigeons, Wild Pigeons], so called by the Swedes in New Sweden.

Pigeons, Wild Pigeons, by the English in North America.

Tourtes, by the French in Canada.

Although these Pigeons have been splendidly illustrated by the above mentioned gentlemen, they have not been able to reproduce their beautiful colors in true accordance with nature, in one respect, at least: the color indicated on either side of the neck should extend much higher up.

Before going further, I shall here give a sufficiently adequate description, first of the male and then of the female, because they are in several respects of a different coloration: in doing this I am using only Latin terms, as these are better understood by ornithologists.

MAS.

Rostrum pro Avis magnitudine tenue, nigrum, aliquantulum aduncum; maxilla superior extra inferiorem prominens, eamque excipiens. Longitudo rostri nudi 5 lin. Geom. Sveth.

Nares semitectae tuberculo oblongo, subcorneo, impressioni digitorum cedenti.

Oculorum Iris coccinea.

Lingua integra, acuta.

Caput totum cinereum in caerulescens vergens; frons tamen sordidius, gula vero vividius cinerea. *Collum* superne cinereum splendens. Ad latera colli, & exinde versus nucham, coloris est cupri splendidissimi in purpureum vergentis, qui in ipsa nucha aliquantulum in viridem mutatur pro diversa versus lucem versura.

Dorsi regio interscapularis cinerascens in pallide fuscum vergens; dorsum inferius dilute glaucum.

Remiges primariae 10, quarum secunda ceteris longior, tum prima, tertia; ceterae ordine breviores. Remiges omnes nigræ quidem, sed diverso modo; nam prima & secunda totæ nigræ; 3–8 nigræ, sed margine exteriore rufescentes, apice albo albescentes; 7, 8, 9, 10 etiam versus interiorem partem albescentes. Remiges secundariæ nigræ, apice albescentes. Tectrices remigum primariarum nigræ, secundariarum proximæ cinereo-glaucæ, remotiores dilute fuscæ maculis quibusdam nigris. Tectrices inferiores alarum dilutissimæ cinereæ.

Cauda complicata longitudine corporis, angusta, Rectricibus 12 diversæ longitudinis; Rectrices duæ supremæ reliquas tegentes nigræ, ceterisque longiores; quæ his subjacent omnes versus apicem quoad tertiam partem albæ, reliqua vero earum pars albescenti-cinerea in cæruleum vergens.

In cauda expansa duæ illæ nigræ longissimæ pennæ medium occupant, seu sunt 6, 6; his proximæ sunt 5, 5; prioribus 6 lin. G. breviores, quarum dimidia pars versus apicem alba, reliqua vero albescenti-cinerea in cæruleum vergens una cum macula nigra interioris partis in ipsis limitibus inter album & cæruleum, & sub hæ alia macula obsoleta rufa. Pennæ 4, 4; 3, 3; 2, 2, superne quoad tertiam partem versus apicem albæ, tantillum cinerei interspersi; versus basin magis cinereæ; inferne in medio inferioris partis macula nigra, & versus apicem macula rufo-fusca seu ferruginea. Pennarum 1, 1, pars exterior alba, interior vero versus basin alba, in medio macula nigra, sub hac macula rufa, versus apicem hæ cinereæ sunt. Ceterum Rectrices 1, 1, fere $\frac{2}{3}$ breviores quam 6, 6; intermediarum vero longitudo proportionata. Uropygium cinereum; tectrices caudæ superiores cinereæ; inferiores vero seu sub cauda albissimæ.

Pectus rufum, qui color versus inferiorem partem dilutior evadit.

Venter albus.

Femora sordide alba. *Tibiae* nudæ, rubentes, *Digiti* omnes, tres antici, & unicus posticus, rubentes; ungues nigri.

FŒMINA:

Rostrum, Nares, Oculi, Lingua ut in Mare.

Caput superne & ad latera, collumque superne cinereum, splendens. Ad latera colli idem color cupri splendidissimus ac in Mare.

Dorsum ut in Mare.

Remiges primariæ 10, quarum ordine tertia omnium longissima; deinde quod ad longitudinem ordine succedunt quarta, prima, secunda, & sic deinceps. Color remigum primariarum & secundariarum tectriciumque idem ac in Mare.

Cauda fere ut in Mare. Uropygium tectricesque caudæ itidem.

Sub rostro alba. *Pectus* dilute fuscum. Venter sordide albus.

Femora, Tibiae, Pedes, Digitiqu eut in Mare. *Ungues* nigri, apice albo.

The size of these Pigeons is about that of a Ringdove.

Their long tail distinguishes them from other Pigeons.

The splendid color which the male and the female have on the sides of the neck and even a little beyond it, is also peculiar, in that the feathers in that region are as if covered with a finely resplendent copper [color], with a purple tint, which back of the neck shifts more into green, particularly with reference to its position toward the light. Rarely is this color more finely repro-

duced than in this bird. Mr. Catesby calls it a golden color, but it can hardly be termed that.

In the copy of Mr. Catesby's work which I have seen, both the head and the back are of a darker color, and the breast is also of a redder color than the bird actually has. This I could very well see when I laid a recently killed male beside Mr. Catesby's figure, as it is the male which is reproduced in his work. Mr. Edward [sic] has entirely omitted the above mentioned copper color both in his description and his figure. It may be that some of the young ones do not have it; but it was found on all those which I have handled, and which were killed in the spring.[1]

Quite a number of these Pigeons may be seen every summer in the woods of Pennsylvania and New Jersey and the adjoining provinces, in which region they live and nest; and it is very seldom that a greater number of them are not observed there in the spring, during the months of February and March, than in the other seasons of the year. But there are certain years when they come to Pennsylvania and the Southern English Provinces in such indescribable multitudes as literally to appall the people. I did not, however, have the opportunity of witnessing such personally (although the spring of the year 1749, when I was there, was considered as one of those in which a greater number of these Pigeons appeared than had been the case for some years previously: yet it was not one of the particular or more unusual ones); but all persons who had observed these happenings and lived long enough to remember several of them recited several incidents connected therewith. Some had even made short notes of various details, of which I will cite the following:

In the spring of 1740, on the 11th, 12th, 15th, 16th, 17th, 18th and 22nd of March (old style), but more especially on the 11th, there came from the north an incredible multitude of these Pigeons to Pennsylvania and New Jersey. Their number, while in flight, extended 3 or 4 English miles in length, and more than one such mile in breadth, and they flew so closely together that the sky and the sun were obscured by them, the daylight becoming sensibly diminished by their shadow.

[1] Edwards' figure represents a distinct species of another genus, namely the *Columba* (= *Zenaidura*) *macroura*.

The big as well as the little trees in the woods, sometimes covering a distance of 7 English miles, became so filled with them that hardly a twig or a branch could be seen which they did not cover; on the thicker branches they had piled themselves up on one another's backs, quite about a yard high.

When they alighted on the trees their weight was so heavy that not only big limbs and branches of the size of a man's thigh were broken straight off, but less firmly rooted trees broke down completely under the load.

The ground below the trees where they had spent the night was entirely covered with their dung, which lay in great heaps.

As soon as they had devoured the acorns and other seeds which served them as food and which generally lasted only for a day, they moved away to another place.

The Swedes and others not only killed a great number with shotguns, but they also slew a great quantity with sticks, without any particular difficulty: especially at night they could have dispatched as many as their strength would have enabled them to accomplish, as the Pigeons then made such a noise in the trees that they could not hear whether anything dangerous to them was going on, or whether there were people about. Several of the old men assured me that in the darkness they did not dare to walk beneath the trees where the Pigeons were, because all through the night, owing to their numbers and corresponding weight, one thick and heavy branch after another broke asunder and fell down, and this could easily have injured a human being that had ventured below.

About a week or a little later subsequent to the disappearance of this enormous multitude of Pigeons from Pennsylvania and New Jersey, a sea-captain by the name of Amies, who had just arrived at Philadelphia, and after him several other sea-faring men, stated that they had found localities out at sea where the water, to an extent of over 3 French miles, was entirely covered by dead Pigeons of this species. It was conjectured that the Pigeons, whether owing to a storm, mist, or snowfall, had been carried away to the sea, and then on account of the darkness of the following night or from fatigue, had alighted on the water and in that place and manner met their fate. It is said that from that date no such tre-

mendous numbers of this species of Pigeon have been seen in Pennsylvania.

In the beginning of the month of February, about the year 1729, according to the stories told by older men, an equally countless multitude of these Pigeons as the one just mentioned, if not a still larger number, arrived in Pennsylvania and New Jersey. Even extremely aged men stated that on 3, 4, 5 or several more occasions in their lifetime they had seen such overwhelming multitudes in these places; and even the parents of these people had in their turn told them that the same phenomenon had occurred several times during their own lives; so that 11, 12, or sometimes more years elapse between each such unusual visit of Pigeons.

From Lawson's *History of Carolina*, p. 141, I see that in the winter of 1707, which was the severest known in Carolina since it was settled by Europeans, an equally awe-inspiring number of these Pigeons had made an appearance in Carolina and the other Southern English Settlements, driven thither by causes which I will now mention.

The learned and observant Doctor Colden told me that during his stay in North America, where he had been since the year 1710, at his country place Coldingham, situated between New York and Albany, he had on two distinct occasions, although at an interval of several years, witnessed the arrival of these Pigeons in such great and unusual numbers that during 2 or 3 hours, while they flew by his house, the sky was obscured by them, and that they presented the appearance of a thick cloud.

All the old people were of the opinion that the months of February and March is the single season of the year when the Pigeons swoop down upon Pennsylvania and the adjacent English Provinces in such marvelous quantities; at other seasons of the year they are not to be seen in any great numbers.

The cause of their migrations from the upper part of the country in such great quantities at this season is twofold: first, when there is a failure of the crop of acorns and other fruit in the places where they otherwise generally spend the winter, thus rendering their supply of food insufficient to last until the ensuing summer; and second, and chiefly, when an unusually severe winter with abundant and long remaining snow happens to occur in their customary

winter haunts, thus covering the ground and making it impossible for them to secure the acorns, beech-nuts and other fruit and seeds on which they otherwise feed at this season: in such cases they are forced to leave these localities and seek their food down along the sea coast where the winters, owing to the sea air, are always milder, and the ground more and earlier free from snow. Experience has shown that both of these circumstances have caused their migrations to take place in such great multitudes.

A peculiar fact and one which older persons have unanimously maintained to be true, is that on all occasions which they could remember, when the Pigeons appeared in such great numbers, there had always been during the preceding autumn, in Pennsylvania and adjacent localities, an abundant crop of acorns and other arboreal seeds, excelling that of several previous years; but during their stay the Pigeons had so carefully searched and ransacked all possible nooks and corners that after their departure it was almost impossible to find a single acorn in the woods.

Several extremely aged men also declared that during their childhood there were, in summertime, many more of the Pigeons in New Sweden than there are now; the cause of this is that the country is at present much more populous and cultivated and the woods more cleared off, and as a result the Pigeons have either been killed off or scared away.

As nearly all the inhabitants of Pennsylvania and the English settlements in the South did not quite know whence these numberless swarms of Pigeons came from, they entreated me to ascertain, during my journeys in the interior of the country, where so many were to be found in summertime, what their food and other economic requirements were at that time of the year, and so on. During my journey to and within Canada I found the desired occasion of learning all of this, which I will now briefly relate.

When toward the end of June, 1749 (new style), I had left the English Colonies, and set out for Canada through the wilderness which separates the English and French Colonies from each other, and which to a great extent consists of thick and lofty forests, I had an opportunity of seeing these Pigeons in countless numbers. Their young had at this time left their nests, and their great numbers darkened the sky when they occasionally arose *en masse*

from the trees into the air. In some places the trees were full of their nests. The Frenchmen whom we met in this place had shot a great number of them, and of this they gave us a goodly share. These Pigeons kept up a noisy murmuring and cooing sound all night, during which time the trees were full of them, and it was difficult to obtain peaceful sleep on account of their continuous noise. In this wilderness we could hear in the night time, during the calmest weather, big trees collapsing in the forests, which during the silence of the night caused tremendous reports: this might in all probability be ascribed to the Pigeons, which according to their custom had loaded a tree down with their numbers to such an extent that it broke down: although other causes might also be found, whereof more is mentioned in the third volume of my American Journey. The additional observations which I had occasion to make as to their economy and manner of life, during my stay in North America, both in Canada, the wilderness of the English Colonies, and in the land of the savages, are as follows:

The birds spend the entire summer in Canada, and particularly do they nest in the vast wild forests and wastes which abound there, where no men are to be found and where seldom any human being ventures. When in summer a person travels through these forests he might easily become terrified by the enormous number of these birds, which in some places almost entirely cover the branches of the trees and, when taking wing, obscure the sky. These Pigeons have, however, their distinct boundaries, outside of which they do not often venture; as for example, somewhat south of Bay St. Paul, which is 20 French miles north of Quebec, not very many of them nest in the woods; and the cause of this is said to be that the oak and the beech tree, which supply them with their principal food, are here arrested in their growth, and grow no further north.

In forests where there are human settlements or where the country is inhabited, only a few are to be seen; and as the land is being gradually cultivated by man, the Pigeons move further away into the wilderness. It is maintained that the cause of this is, partly, that their nests and young are disturbed by boys, partly their own sense of a lack of safety, and finally that during a great part of the year their food is shared by the swine.

They build their nests in high trees, pine trees as well deciduous ones; often as many as 40 or 50 nests are to be found in the same tree.

Some maintain that they raise two broods of young every summer.

In places where they nest in abundance the ground is often covered with their droppings to a thickness of one or two feet.

While these birds are hatching their young, or while the latter are not yet able to fly, the savages or Indians in North America are in the habit of never shooting or killing them, nor of allowing others to do so, pretending that it would be a great pity on their young, which would in that case have to starve to death. Some of the Frenchmen told me that they had set out with the intention of shooting some of them at that season of the year, but that the savages had at first with kindness endeavored to dissuade them from such a purpose, and later added threats to their entreaties when the latter were of no avail.

In Canada it is almost everywhere the custom for young farmhands and boys to investigate where the Pigeons have their nests, and as soon as the young are able to fly they are taken from the nest and brought to the farm, where they are afterward kept in suitable quarters and industriously fed, whereupon they are killed and eaten. To make doubly sure that they do not escape, one of their wings is generally cut short so that even in case they do get out, they cannot fly away. Such nestlings have a good appetite, thrive comfortably, become quite tame and within a short time, if well taken care of, accumulate so much fat that they afford a most palatable dish.

For *food* these Pigeons select the following fruits, which I will name in the order that they mature:

Seeds of the *Red-flowered Maple* [*Acer*]; these mature in Pennsylvania at the end of May, but somewhat later further North.

Seeds of the *American Elm* [*Ulmus americana*]; these mature in Pennsylvania in the beginning or middle of June, but further north somewhat later. When on our journey through the wilds between Albany and Canada we cut up some of the Pigeons which the French had shot and given us, their crops were generally found to be full of elm-seeds.

Mulberries. These ripen in Pennsylvania in the beginning of June (new style), and are relished by these Pigeons almost above everything else. During my stay in the last mentioned locality, in 1750, I noticed that as soon as the mulberries became ripe the pigeons put in their appearance in great numbers. Wherever a Mulberry tree grew wild it was at this time generally full of Pigeons which devoured the berries. They often caused me much vexation because if I had located a Mulberry tree in the woods with the intention of securing seeds when the berries became ripe and it should happen that I did not watch out for the proper time, the Pigeons had generally, in the meanwhile, been so industrious in their picking that on my arrival scarcely a single berry was left. If some of them were shot the others generally flew away a little distance, but returned within a few minutes to the same Mulberry tree; so that a person who owned such trees found no difficulty to obtain daily a sufficient quantity of choice meat as long as the mulberries lasted.

They consume *all kinds of grain*, with the single exception of corn, which is left untouched by them, although it has other enemies. I noticed that they were particularly fond of the following kinds of grain:

They ate *Rye*, although not with particular avidity, but rather as if in the absence of something else more palatable. Some persons assured me that they had seen with their own eyes how these Pigeons, during summer time, when they had come to a ripe wheat field, alighted on the fences, vomited up the Rye on which they had previously feasted, and then swooped down upon the wheat field, where they gorged their crops with wheat, as being more appetizing.

Wheat is one of their most coveted foods, which may be seen from what has already been stated, as well as from many another experience. As soon as the wheat fields become ripe they swoop down on them in enormous numbers and take considerable toll of them. When the wheat is stacked up in the field they also visit it and devour all too much of it, if they should happen to be in the least hungry. In the fall, when the wheat is recently sown, they alight in full force in the fields and not only pick up the grains which are more or less in broad daylight, but also poke up

those which the plough has not sunk sufficiently deep. In order to prevent such a damage boys as well as others are seen at this season of the year running around armed with guns and other "contraptions," to kill or scare them away. On such occasions, however, they are not in general particularly timid, especially the young ones, so that when a few of them have been shot at a stack, the others oftentimes fly away only a short distance to another stack, and hence the gunner, albeit he has made some lucky shots, generally becomes exhausted before the birds become scared. In Pennsylvania this species of grain, as well as the Rye, commonly ripens about midsummer (old style), and sometimes earlier; but further North it ripens later.

Buckwheat they are also very fond of, and levy considerable tribute on it. The Buckwheat matures in Pennsylvania in the middle of September, old style.

The berries of the *Tupelo or Sour-gum tree* (*Nyssa*), they also consume with great avidity. In Pennsylvania these ripen in September. This tree does not grow in Canada.

Acorns.— Most forests in North America consist of oak, of which arboreal genus there are several species; of these the greater part have nearly every year a great number of acorns which in the autumn fall off in such quantities that quite often the ground below the oaks is covered by them one hand high and sometimes more. These serve as food for several kinds of animals and birds, as for instance Squirrels of several species, Forest Mice, Wild Pigeons, &c., in addition to which, in places inhabited by Europeans, they serve as the staple food of hogs during the greater part of the year. During certain years the numberless swarms of Wild Pigeons already described come to Pennsylvania and the other English Provinces, in search of these acorns. In Pennsylvania and other localities in North America the acorns mature in September and the following months.

They are also very fond of *Beech-nuts*. There is a great abundance of beech-trees in Canada, but further south they grow somewhat more sparsely. In Canada the nuts become ripe in the middle of September. These, together with acorns, constitute the principal food of the Pigeons during the entire latter part of the fall and throughout the winter.

In addition to the kinds already enumerated they also consume various other seeds and berries of trees and plants which grow in this country.

The trees above referred to, the seeds and berries of which the Pigeons are so fond of, grow in the forests of North America nearly everywhere in great abundance. In a good many places, especially further inland, oaks, elms, beeches and the red-flowered Maple constitute almost alone, with the addition of the Walnut tree, the entire forest tract. Thus it will be seen how the all-wise CREATOR, even in the case of these birds, has so wisely adapted the size of the food supply to the number of mouths to be fed.

I have also observed that the Pigeons have a special fondness for the kind of soil which is much mixed with common salt [alkaline deposits]; this soil serves them as food, as a spice to blend with the food, or for its medical properties,— I do not know which. At the Salt springs of Onondago [*sic*], in the tribe of the Iroquois Indians, where the soil is so strongly mixed with salt that the ground during a severe drought becomes entirely covered with it and as white as frost, making it impossible for plants to grow, I noticed with astonishment, in the month of August, 1750, how covetous the Pigeons were of this kind of soil. The Savages in Onondago had built their huts on the sides of this salt field, and here they had erected sloping nets with a cord attachment leading to the huts where they were sitting: when the Pigeons arrived in swarms to eat of this salty soil, the Savages pulled the cords, enclosing them in the net, and thus at once secured the entire flock. At certain times, when they came in such numbers that the ground could hardly be seen for them, the Savages found it more advisable to use a gun, as by a single discharge of birdshot they could sometimes kill as many as 50 or more; and this proved a splendid source of food supply.

These Wild Pigeons fly in the same manner as other Pigeons; and as soon as they have alighted in a tree or other place they have a habit of making a clapping sound with their wings which, according to some, is a signal for all the others to alight. At times and when they have had sufficient food, they are quite timid, especially the old birds. Therefore, when one wishes to shoot them it is best to walk to and fro among them, on the ground,

as if one did not see them: then they are not so timid, nor do they take wing so soon.

In the vast forests of Canada they remain to the end of August or beginning of September (new style); *i. e.*, until the grain has been stored for the winter. A great number, however, remain until late in the autumn, when the first snow begins to fall, which finally drives them all away. As their food mostly consists of acorns, beech nuts and the seeds and fruits of other trees which become hidden under the snow, they are obliged to leave these places and betake themselves further South, where the ground is bare all winter. Not one of them remains in Canada throughout the winter: but they generally spend this season in the vast forests of the *Illinois*, who live at about the same latitude as Pennsylvania and Virginia. They do not willingly migrate toward the Sea-board, where the country has been extensively cultivated by the English, and the forests are much cut down; partly because they cannot there secure a sufficient food supply, and partly to avoid running the risk of getting killed by the number of people and gunners in that section. They prefer the vast and dense forests in the interior of the country where there are no human habitations for many miles around. But, should it happen during a certain year that there is a failure of the crop of acorns or other food suitable for them, or an unusually severe winter with great snow fall sets in, which to some extent covers the ground, then they are forced to leave their usual winter quarters and seek their way to the English settlements down the sea-board. It is on these occasions that they swarm into Pennsylvania in such enormous numbers; but as soon as the weather changes a little and becomes milder, they again retire further inland. Here they remain until the last snow disappears in the spring.

As the snow gradually melts away in the spring the Pigeons migrate further and further North, and when northern Canada is free from snow, which generally occurs toward the end of April or the beginning of May, the Pigeons arrive in their old haunts and commence their mating, nesting, hatching of eggs and the rearing of their young, etc.

The French in Canada, who annually catch a number of young Pigeons alive which they thereafter rear at their homes, have

taken much pains to tame these birds, although with but little success. It is very easy, when they are kept in suitable quarters to make them so tame as to feed from one's hands, in the manner of any other domesticated Pigeon; but as soon as they are let out into the open hardly a few days pass before they fly away to the woods, nevermore to return. It was, however, emphatically asserted, that some had succeeded in taming them to the same extent as the domesticated Pigeons.

As they fly in great flocks and keep close together, whether on the wing, on the ground or in the trees, so poor a marksman as to fail to make a hit is difficult to find. Several persons told me that a man who lived at Schenectady, between Albany and Col. Johnson's farm, had killed 150 of these birds with two discharges of birdshot, and in Canada there is said to have been several cases where 130 had been killed in a single shot.

Their flesh is a delight to the epicure, and especially is the meat of the young Pigeons scarcely second in delicacy to that of any other bird.

The great French Admiral Marquis de la Galissoniere, who in deep knowledge of various sciences, but especially in natural history and its advancement, has had or has very few equals, and who at the time of my arrival in Canada occupied the office of Governor-General of that country, told me that he had once brought with him several of these Pigeons from Canada to France, and that he had allowed them to escape in the French forests. At this time he had again collected a great number of live birds which in the fall of 1749 he brought with him to France, enclosed in large cages, in order to set them free in the woods, upon his safe arrival there, with the intention of introducing this handsome as well as useful American bird into Europe.

In addition to the authors referred to above, the following learned men have also mentioned something in their writings concerning these Pigeons, namely: P. de Charlevoix, *Histoire de la Nouvelle France,* T. V, pp. 251–252; Salmon's *Modern History,* Vol. III, p. 440; Williams' *Key into the Language of America,* p. 91. Others whom I have not had the opportunity of seeing may also have mentioned something concerning this subject, but they have at least related nothing of any particular value.

A YEARS' COLLECTING IN THE STATE OF TAMAULIPAS, MEXICO.

BY JOHN C. PHILLIPS.

ON THE first of August, 1908, the well-known collector, Mr. Frank B. Armstrong, began work in the State of Tamaulipas, Mexico, collecting the series of birds which is listed below. The work was continued for one year.

The localities visited ranged from Matamoros, at the northeast extremity of the State, to Altamira in the extreme south. Most of the time, however, was spent in the hill region west and north of Ciudad Victoria in the valleys of the Sierra Madre mountains, which here form the western boundary of the State of Tamaulipas, and along the river valleys east of the mountains. It may be well to mention here the general character of the stations represented by the collection, beginning with Matamoros.

The country about Matamoros is the level valley bottom of the Rio Grande, where the general vegetation is chaparal, bunch cactus and mesquite, at a level of only eighty feet above the sea. San Fernando, some seventy miles south on the River Presos, is also near the coast, and is surrounded by a country very much like that of the Rio Grande Valley, and of low elevation. These regions were visited in August, October, December and February.

The intermediate region embraces the several localities lying north and west of Ciudad Victoria. It can be roughly divided into a mountain region: Santa Leonor, and the hill settlements of Realito, Carricitos, Montelunga, Galindo, Rampahuila, Portrero, Guiaves; and a plain region, embracing the following river localities: Santa Engracia, Caballeros, Cuidad Victoria, Martinez and La Cruz. Both of these regions were visited in autumn, September and October; and again in March, April, May, June and July. The following description of the two regions is taken from Mr. Armstrong's letters:

"Santa Leonor is at the base of the mountains, at the mouth of a great cañon. Here the trail starts up the first hill in a winding course until it reaches the summit, and thence downward a little;

and then ascends the second ridge of hills, and so on over about four great hills until Realito is reached, at an elevation of about 8000 feet. This same trail forks out in different directions to various mines and settlements throughout the mountains. At Santa Leonor the scrub brush disappears, and around and in the cañon there are heavy ebony forests mixed with elm (probably not a true elm) and buttonwood trees which attain a great height, with a heavy underbrush and many vines, so thick that one can scarcely see six feet through it. Here is the home of Brasher's Warbler, Berlandier's Wren, Blue-crested Mot-mot, and Coppery-tailed Trogon. The only chance to catch a glimpse of these birds is when they cross a trail or wood road, as the thicket is so dense and tangled that one can hardly push a way through it.

"This is the condition of the cañon until it reaches considerable elevations, or traverses several miles. Above Santa Leonor, on the trail that ascends the first hill, in going up, one passes through a thicket of green bushes with heavy foliage, and from this to more open places, with scrubby, spreading bushes and big rocks, and further up the oak begins with tall grass and boulders everywhere. This continues on the ascent for some way, when the great pines[1] begin; and then at an elevation of say 3000 feet, up to 10,000 feet, the mountains are about the same: immense pines over the slopes, intermixed with oaks, and tall grass and boulders everywhere.

"Most of the birds labelled Santa Leonor were taken in the cañon and in front of the cañon where the plains begin, very few being taken on the hill slopes back of or above the town.

"Carracitos (6000 feet) is the name given a valley between two ridges, where a dam was constructed making a small lake. This place being flat, or nearly so, is covered with a big pine grove with oaks and boulders on the slopes on either side of it. Here are Wild Turkey, Deer and Massina Partridge; and on the slopes, Couch's Jay, Ant-eating Woodpeckers, Boucard's Sparrow, Jouy's Warbler, and Hepatic Tanager. This place is used by freighters to pasture and rest up their pack mules, and has been a camping place for many years. The first Smith's Nightingale Thrush was taken on

[1] Probably *Pinus cerunoides* and *P. nelsoni* on the lower slopes, and *P. ponderosa* and a form of *P. montezumæ* on the higher slopes, according to a letter from Mr. G. R. Shaw.

Sketch Map of State of Tamaulipas Mexico

the slopes above this point, the only bird of the species seen here. Afterwards, in an entirely different locality, many were taken. They will be mentioned further on in the description of Galindo.

"The next place is Montelunga, situated on a little plateau, "mesa," or table-land, at an elevation about 5000 feet. Here the trees are all tall pines, except in a cañon which skirts the place, where tall trees like elms are found, and some underbrush.

"Azure Bluebirds were taken on the table-lands; also Boucard's Sparrow; several species of warblers in migration; Couch's Jay; woodpeckers, etc.; and in the cañon, solitaire or "silgara" wrens, and trogons.

"The next station Galindo is peculiarly well adapted for bird collecting. It is really a wide cañon with great slopes on each side, towering to a height of several thousand feet, and shutting in a valley of some miles of dense, damp virgin forest. The mountain sides shut out the winds, and make Galindo as silent as night. At one end of the valley is a small settlement of miners — only a few houses. At the other end is the forest the trees in which attain to so great a height that a charge of shot will not reach the upper branches.

"Among the birds taken here were hummingbirds of different kinds, attracted by the great variety of flowers and air plants. The shady depths of this place are the home of two species of whippoorwill, and in about the same spots we found a number of Smith's Nightingale Thrush, and the Fulvous Nightingale Thrush. They, like many other birds, were placed by their note, which was heard plainly through the stillness of the forest. Throughout this same damp forest were found various warblers, vireos, tanagers, trogons, thrushes, etc., and on the slopes, jays, woodpeckers, and other forms that inhabit the mountains everywhere.

"Realito, at a still higher elevation, is also a mining settlement of two or three huts near a spring close to the summit of a big mountain, the country is level or rolling, and covered with pines and oaks. Here the birds differed a little from those of Galindo.

"Similar in character are Rampahuila and Portrero, mining camps nearby.

"Guiaves cañon is like Galindo, but is narrower and its slopes

are perpendicular, with more bare cliffs. The cañon is also much deeper, but the vegetation is the same as at Galindo. The plains in front of Santa Leonor are all much alike, as are the mountains for the most part.

"The stony plains regions are covered with a plant called anacquito; and the ground is almost bare of grass. The country is slightly rolling and uniform, except for the river bottoms. These plains are threaded by a number of little streams, at intervals of some ten or fifteen miles. Along these water courses is a growth of tall elm and other big trees; also cypress, and an underbrush of green saplings, vines, and weeds. The streams are Cruz, Santa Engracia, Caballero, Martinez, and Victoria; and a description of one suits the others. The map shows their location; and their vegetation and general character are the same. They are strong, and very shallow; some places only two inches deep, and from sixty to two hundred feet wide."

"Altamira[1] in the lowlands has a sandy soil, tropical vegetation, except for oak timber, and numerous tule swamps. There are very few wagon roads, all traffic being done on horseback over trails. The forest in places is a regular jungle, with vines and rank foliage and several species of stunted, thorny bushes, or trees, in the higher places; and a weed-like pineapple plant (called "huipia") covers the ground and makes the woods practically impassable, on account of the cat-claw thorns along its leaves. Hunting can be done only along cut trails through the forest; a bird falling twenty feet from the trail is seldom secured, as a few steps through this hiupia will generally throw a man down, claw him, and nearly prevent him from getting on his feet. Mosquitoes, fevers, 'nighuas' (a flea that buries itself in the flesh), and everything else that is disagreeable, attend camping in this section."

As to the climate of Tamaulipas, Mr. E. W. Nelson of the United States Biological Survey has been kind enough to furnish me with notes of a general character. He says that the climate, like that of the rest of eastern Mexico, is divided into a wet and a dry season. The wet season begins in June and July and lasts

[1] Altamira, in the extreme southeastern part of the State, was visited in the last eighteen days of December, but owing to the severe malaria which Mr. Armstrong contracted in the humid swamps, the region was not visited again.

till from September to November. The dry season covers the rest of the year, interrupted, however, by cold winter storms which are usually the southern prolongation of Texas "northers." The northern part of the State is subject to severe frosts, but the southern part is beyond the ordinary frost belt. Summer rains are usually plentiful along the coast lowlands, which occupy the largest part of the State, but the northern half is sometimes subject to prolonged and excessive droughts.

The heaviest rains in the State fall in summer along the mountain chain in the western part (Sierra Madre). The southern part has regularly a much greater summer rainfall than the northern half.

Special thanks are due Mr. E. W. Nelson for time generously given in comparing many of our series of birds with those in the National Museum. To Mr. Outram Bangs is due credit for a large share of the work in sorting and arranging specimens as the material came in, and for valuable help.

The collection, of which an annotated list follows, is now merged in the general collections of the Museum of Comparative Zoölogy at Cambridge.

List of Species.

ARDEIDÆ.

Herodias egretta (*Wilson*).— 1 ♂, Matamoros, Jan. 24.

Egretta candidissima candidissima (*Gmelin*).— 1 ♀, Matamoros, Jan. 23.

Hydranassa tricolor ruficollis (*Gosse*).— 1 ♂, Matamoros, Jan. 20.

Nyctanassa violacea violacea (*Linn.*).— 1 ♂, Matamoros, June.

Heterocnus cabanisi (*Heine*).— 1 ♀, Rio Cruz, May 9.

IBIDIDÆ.

Plegadis guarauna (*Linn.*).— 3, both sexes, Matamoros, Jan. 21–Feb. 9.

ANATIDÆ.

Olor buccinator (*Richardson*).— 1 ♀, Matamoros, Jan. 21. This is a typical specimen of the species and constitutes its first Mexican record.

Cairina moschata (*Linn.*).— 2 ♀: Altamira, Dec. 31; Rio Cruz, May 13.

Chen hyperboreus hyperboreus (*Pallas*).— 1 ♀, Matamoros, Jan. 21.

Chaulelasmus streperus (*Linn.*).— 3, both sexes, Matamoros, Jan. 20–31.

Mareca americana (*Gmel.*).— 1 ♂, Matamoros, Jan. 20.

Nettion carolinense (*Gmel.*).— 1 ♀, Rio Martinez.

Dafila acuta (*Linn.*).— 4, both sexes, Matamoros, Jan. 26–Feb. 13.

Querquedula discors (*Linn.*).— 1 ♂, Matamoros, Jan. 18.

Querquedula cyanoptera (*Vieill.*).— 1 ♂, Matamoros, Jan. 19.

Spatula clypeata (*Linn.*).— 2 ♂, Matamoros, Feb. 1.

Marila americana (*Eyt.*).— 1 ♀, Matamoros, Jan. 22.

Marila vallisineria (*Wilson*).— 3, both sexes, Matamoros, Jan. 25–Feb. 11.

Marila affinis (*Eyt.*).— 2 ♂, Matamoros, Jan. 26.

FALCONIDÆ.

Micrastur melanoleucus (*Vieill*).— 1 ♂, Caballeros, Sept. 7.

Geranospizias niger (*Du Bus*).— 1 ♀, Cañon Guiaves, Sept. 15.

Parabuteo unicinctus harrisi (*Aud.*).— 3 ♂: Matamoros, Dec. 5–Jan. 31; Altamira, Dec. 17.

Accipiter velox (*Wilson*).— 3, both sexes: Montelunga, Oct. 12; Altamira, Dec. 20; Galindo, April 22.

Accipiter cooperi (*Bonap.*).— 1 ♂, Matamoros, Nov. 16.

Buteo borealis calurus *Cass.*— 1 ♂, Galindo, March 21.

Buteo albicaudatus sennetti *Allen.*— 5, both sexes: Altamira, Dec. 28–30; Matamoros, Jan. 18.

Asturina plagiata *Schlegel.*— 7, both sexes: Altamira, Dec. 20–21; Rio Martinez, Feb. 28–March 2; Santa Leonor, March 9; Rio Cruz, May 10–14.

Rupornis griseicauda *Ridgw.*— Altamira, Dec. 17–22; Caballeros, Sept. 7; Rio Cruz, June 19–24; Santa Leonor, April 14.

Urubitinga anthracina (*Litch.*).— 3, both sexes: Galindo, March 22; Rio Cruz, May 7–8.

Urubitinga ridgwayi *Gurney.*— 3, both sexes, Altamira, Dec. 21–Jan. 4.

Elanus leucurus (*Vieill.*).— 2 ♀, Altamira, Dec. 16, 21.

Falco peregrinus anatum *Bonap.*— 1 ♂, Matamoros, Jan. 22.

Falco columbarius columbarius *Linn.*— 1 ♀ (young), Matamoros, Nov. 16.

Falco columbarius richardsoni *Ridgw.*— 1 ♂, Matamoros, Jan. 25.

Falco fusco-cærulescens *Vieill.*— 3 ♂: Cañon Guiaves, Sept. 17; Altamira, Dec. 23; Matamoros, Feb. 14.

Cerchneis sparveria phalœna (*Lesson*).— 2, both sexes, Matamoros, Nov. 8–Dec. 1.

TINAMIDÆ.

Crypturus mexicanus *Salvadori.*— 8, both sexes: Rio Cruz, April 16–July 7; Santa Leonor, April 12–16.

CRACIDÆ.

Crax globicera *Linn.*— 1 ♂, Guiaves, April 31.

Penelope purpurascens *Wagler.*— 2, both sexes, Guiaves, May 4.

Ortalis vetula mccalli *Baird.*— 7, both sexes: Rio Cruz, July 5; Rio Martinez, Feb. 23–March 1; Santa Leonor, March 10.

MELEAGRIDÆ.

Meleagris gallopavo intermedia *Sennett.*— 1 ♂, Rio Cruz, March 9.

ODONTOPHORIDÆ.

Callipepla squamata castanogastris *Brewster.*— 7, both sexes: San Fernando, Oct. 20–27; Aquas Calientes, May 8.

Colinus virginianus texanus *Lawrence.*— 8, both sexes: Matamoros, Aug. 20–Oct. 30; San Fernando, Oct. 19–20.

Colinus virginianus maculatus *Nelson.*— 63, both sexes: Guiaves, Sept. 21–April 31; Rio Santa, Sept. 8; Santa Leonor, Sept. 11–April 15; Rio Cruz, May 6–June 30; Montelunga, April 29; Victoria, April 12; Altamira, Dec. 1–25.

Cyrtonyx montezumæ montezumæ (*Vig.*).— 4, both sexes and 1 chick: Yerba Burna, Sept. 29–30; Rampahuila, Sept. 27; Carricitos, Oct. 15.

RALLIDÆ.

Porzana carolina (*Linn.*).— 1 ♂, Matamoros, Jan. 22.

JACANIDÆ.

Asarcia spinosa (*Linn.*).— 6, both sexes, Dec. 25–31.

CHARADRIIDÆ.

Podasocys montanus (*Townsend*).— 2, both sexes, Matamoros, Nov. 30.

Oxyechus vociferus vociferus (*Linn.*).— 1 ♂, Matamoros, Nov. 18.

Himantopus mexicanus (*Müll.*).— 1 ♂, Matamoros, Feb. 10.

Recurvirostra americana *Gmel.*— 1 ♂, Matamoros, Jan. 12.

Numenius americanus americanus *Wilson.*— 1 ♂, Matamoros, Feb. 11.

Numenius americanus parvus *Bishop.*— 1 ♂, Matamoros, Jan. 18.

Catoptrophorus semipalmatus semipalmatus (*Gmel.*).— 2, both sexes, Matamoros, Jan. 17–21.

Totanus flavipes (*Gml.*).— 1 ♂, Rio Cruz, May 11.

Actitis macularia (*Linn.*).— 1 ♀, Rio Martinez, Mar. 2.

Gallinago delicata (*Ord*).— 3 ♂, Altamira, Dec. 14–21.

COLUMBIDÆ.

Columba flavirostris flavirostris *Wagler.*— 6, both sexes: Altamira, Dec. 22; Rio Cruz, July 5–21.

Zenaidura macroura carolinensis (*Linn.*).— 1 ♂, Galindo, Oct. 1.

Scardafella inca inca (*Less.*).— 13, both sexes: Matamoros, Aug. 19–Nov. 3; San Fernando, Oct. 19–23; Rio Martinez, Feb. 25–March 2.

Chæmepelia passerina pallescens *Baird.*— 11, both sexes: Matamoros, Aug. 22–Dec. 5; San Fernando, Oct. 30.

Leptotila fulviventris brachyptera (*Salvadori*).— 1 ♂, Rio Cruz, June 18.

PSITTACIDÆ.

Ara militaris (*Linn.*).— 1 ♀, Rio Cruz, June 30.

Conurus aztec (*Souancé*).— 10, both sexes, Altamira, Dec. 17–31.

Amazona oratrix *Ridgway.*— 1 ♀, Rio Cruz, June 30.

Amazona viridigena *Cassin.*— 5, both sexes: Rio Martinez, March 4; Rio Cruz, June 24–July 22; Santa Leonor, April 8.

CUCULIDÆ.

Coccyzus americanus americanus (*Linn.*).— 5, both sexes: Rampahuila, Sept. 26; Santa Leonor, Sept. 11; Galindo, Oct. 4; Guiaves, Sept. 19.

Crotophaga sulcirostris *Swains.*— 5, both sexes: Altamira, Dec. 27–28; Guiaves, Sept. 17–21; Matamoros, Aug. 24.

PICIDÆ.

Chloronerpes æruginosus *Licht.*— 16, both sexes: Rampahuila, Sept. 28; Rio Santa, Sept. 8; Santa Leonor, Sept. 13; Guiaves, Sept. 21; Portrero, Sept. 24; Rio La Cruz, Sept. 10–July 16; Galindo, March 21–23; Rio Martinez, Feb. 27.

Melanerpes formicivorus formicivorus (*Swainson*).— 20, both sexes: Yerba Burna, Sept. 29; Galindo, Oct. 3–March 26; Guiaves, Oct. 9; Realito, May 22–June 16.

Melanerpes aurifrons (*Wagl.*).— 14, both sexes: Matamoros, Nov. 4–Dec. 1; San Fernando, Oct. 21–30; Altamira, Dec. 10; Rio La Cruz, June 18.

Sphyrapicus varius varius (*Linn.*).— 14, both sexes: Matamoros, Nov. 27–Dec. 3; Galindo, March 15–April 23.

Dryobates villosus intermedius *Nelson.*— 4, both sexes: Galindo, Oct. 1–April 20; Montelunga, Oct. 10–April 29.

Dryobates scalaris bairdi (*Scl.*).— 11, both sexes: Matamoros, Aug. 17–Dec. 4; San Fernando, Oct. 24–27; Altamira, Dec. 13; Rio Martinez, Feb. 24.

Campephilus guatemalensis guatemalensis (*Hartl.*).— 4, both sexes: Santa Leonor, March 9–April 13; Rio Cruz, July 8.

Ceophlœus scapularis scapularis (*Vigors*).— 12, both sexes: Altamira, Dec. 2–20; Rio Santa, Sept. 8; Santa Leonor, Sept. 12, Mar. 13; Cañon Guiaves, Sept. 16; Rio Martinez, Mar. 4.

TROGONIDÆ.

Trogon mexicanus *Swains.*— 21, both sexes (including specimens in nesting and moulting plumage): Rampahuila, Sept. 28; Galindo, Oct. 1–May 23; Guiaves, Sept. 20; Rio Santa, Sept. 8; Montelunga, Oct. 11; Altamira, Dec. 20; Realito, June 4.

Trogon ambiguus *Gould.*— 37, both sexes: Santa Leonor, March 9–April 14; Rio Martinez, March 1–3; Galindo, March 16–April 20; Guiaves, May 1; Montelunga, April 27; Rio Cruz, June 25; Realito, May 24–July 16.

MOMOTIDÆ.

Momotus cæruleiceps (*Gould*).— 15, both sexes: Caballeros, Sept. 7; Rio Martinez, Feb. 23–March 11; Rio Cruz, June 27–July 6.

ALCEDINIDÆ.

Ceryle torquata (*Linn.*).— 4, both sexes: Rio Martinez, March 2; Rio Cruz, May 11.

Ceryle alcyon (*Linn.*).— 1 ♂, Altamira, Dec. 21.

Ceryle americana septentrionalis *Sharpe.*— 7, both sexes: Rio La Cruz, Sept. 10; Santa Leonor, Sept. 13; Rio Martinez, Sept. 9–March 3; Caballeros, Sept. 6.

STRIGIDÆ.

Strix virgata tamaulipensis subsp. nov.

Type (and only specimen), Rio Martinez, State of Tamaulipas, Mexico, Feb. 25, adult ♂, No. 49982, Museum of Comparative Zoölogy.

Characters.— Similar to true *Strix virgata* of southeastern Mexico and Central America, with transverse pale lines on the head and back, as in that form. Not with the pale markings above in the form of spots as in

S. v. squamulata of western Mexico, but with the general color of the upper parts even paler and grayer than in the latter form.

Measurements.— Type, adult ♂, wing, 243; tail, 145; tarsus, 46; culmen from forward edge of cere, 18.

Remarks.— This bird comes from the dry mountains of western Tamaulipas where the conditions are more arid than further south.

Otus asio mccalli (*Cass.*).— 2, both sexes, Rio Martinez, Feb. 26; Santa Leonor, March 31.

Speotyto cunicularia hypogæa (*Bonap.*).— 9, both sexes, Matamoros, Nov. 5–Feb. 14; Altamira, Dec. 12.

Glaucidium gnoma gnoma (*Wagler*).— 3, both sexes, Galindo, March 21–27.

Glaucidium phalænoides ridgwayi *Sharpe.*— 9, both sexes: Matamoros, Aug. 16; Rio Martinez, Feb. 24–March 5; Santa Leonor, April 3–4; Rio Cruz, June 20; Guiaves, April 31.

Asio flammeus (*Pontoppidan*).— 1 ♂, Matamoros, Dec. 1.

CAPRIMULGIDÆ.

Chordeiles virginianus henryi *Cass.*— 3, both sexes: Matamoros, Aug. 15–23; Montelunga, April 30.

Chordeiles acutipennis texensis *Lawr.*— 11, both sexes: Rio Cruz, June 19–July 20; Santa Leonor, April 14–17; Montelunga, April 28–29.

Nyctidromus albicollis merrilli *Sennett.*— 29, both sexes: Matamoros, Aug. 24–Nov. 26; San Fernando, Oct. 19–28; Altamira Dec. 13–19; Santa Leonor, April 16; Rio Cruz, July 2.

Antrostomus notabilis *Nelson.*— 8, both sexes: Santa Leonor, April 14–16; Rio Cruz, June 28–July 4.

Only two or three specimens of this bird were known to science until this series was secured.

Antrostomus vociferus macromystax (*Wagler*).— 25, both sexes: Galindo, Oct. 5–April 24; Santa Leonor, April 12–13; Montelunga, April 26; Realito, May 27–June 7.

MICROPODIDÆ.

Chætura richmondi *Ridgway.*— 2, both sexes: Carricitos, Oct. 15; Guiaves, Oct. 8.

TROCHILIDÆ.

Amizilis cerviniventris chalconota *Oberholser.*— 30, both sexes: Altamira, Dec. 11–23; Matamoros, Aug. 27; Santa Leonor, March 8–April 8; Rio Cruz, June 25–July 5.

Phæoptila latirostris (*Swainson*).— 20, both sexes: Santa Leonor, March 3–April 28; Realito, June 2.

Hylocharis leucotis (*Vieill.*).— 11, both sexes: Galindo, March 14–April 20; Realito, May 31–June 8.

Eugenes fulgens (*Swainson*).— 17, both sexes: Rampahuila, Sept. 26–28; Galindo, March 16–April 19; Realito, June 1–6.

Cœligena clemenciæ (*Less.*).— 7, both sexes, Galindo, March 19–April 19.

Archilochus colubris (*Linn.*).— 7, both sexes: Yerba Burna, Sept. 30; Galindo, Oct. 5–March 22; Rampahuila, Sept. 28; Guiaves, Oct. 7; Santa Leonor, April 5–6.

Selasphorus platycercus (*Swains.*).— 1 ♀, Santa Leonor, April 3.

Atthis heloisa (*Less & Delattre*).— 10, both sexes: Galindo, April 18–25; Realito, May 27–June 10.

DENDROCOLAPTIDÆ.

Xiphorhynchus flavigaster flavigaster *Swains.*— 2 ♀, Altamira, Jan. 1.

Picolaptes affinis affinis (*Lafr.*).— 11, both sexes: Galindo, Oct. 1–March 21; Realito, May 22–June 3.

COTINGIDÆ.

Platypsaris aglaiæ aglaiæ (*Lafr.*).— 12, both sexes: Galindo, Oct. 4; Rio Santa, Sept. 8; Altamira, Dec. 24; Rio Martinez, Feb. 28–March 4; Santa Leonor, March 7–10; Rio Cruz, July 12–21.

TYRANNIDÆ.

Camptostoma imberbe *Sclater.*— 3 ♂: Guiaves, Sept. 15–21; Altamira, Dec. 11.

Myiozetetes texensis texensis (*Giraud*).— 5, both sexes, Altamira, Dec. 10–Jan. 1.

Pyrocephalus rubinus mexicanus (*Scl.*).— 18, both sexes: Matamoros, Aug. 22–Dec. 5; San Fernando, Oct. 28; Altamira, Dec. 14–24.

Nuttallornis borealis (*Swains.*).— 10, both sexes: Galindo, Oct. 1–5; Guiaves, Oct. 7–9; Portrero, Sept. 24; Realito, Jan. 1–5; Montelunga, April 29.

Myiochanes pertinax pallidiventris (*Chapman*).— 23, both sexes: Rampahuila, Sept. 26–27; Yerba Burna, Sept. 29; Montelunga, April 29; Realito, May 28–June 8; Galindo, March 14–27.

Remarks.— This large series represents *pallidaventris* in its extreme form. The upper parts are grayer than in birds from Arizona and Sonora, especially about the neck. The under parts do not differ, and the wing measurements are the same.

Myiochanes virens (*Linn.*).— 4, both sexes: Matamoros, Aug. 28–Sept. 1; Caballeros, Sept. 6; Montelunga, April 27.

Myiochanes richardsonii richardsonii (*Swains.*).— 8, both sexes: Rampahuila, Sept. 27; Santa Leonor, Sept. 11; Guiaves, Sept. 18–Oct. 7; Montelunga, April 28–30.

Empidonax flaviventris (*Baird*).— 9, both sexes: Matamoros, Aug. 25–30; San Fernando, Oct. 21; Guiaves, Sept. 20; Galindo, March 16–20; Rio Martinez, Feb. 28.

Empidonax trailli trailli (*Aud.*).— 12, both sexes: Matamoros, Aug. 16–Aug. 30; Guiaves, Sept. 22.

Empidonax minimus (*Baird*).— 11, both sexes: Matamoros, Aug. 19–30; Rio Martinez, Sept. 9; Rio Cruz, Sept. 10; Caballeros, Sept. 7; Altamira, Dec. 13–14; Santa Leonor, April 9.

Empidonax hammondi (*Xantus*).— 10, both sexes: Galindo, March 14–20.

Empidonax wrighti *Baird.*— 1 ♂, Galindo, March 18.

Empidonax difficilis difficilis *Baird.*— 4, both sexes, Galindo, March 19–22.

Sayornis phœbe (*Latham*).— 22, both sexes: Matamoros, Oct. 27–Dec. 1; San Fernando, Oct. 21–25; Rio Martinez, Feb. 25–March 4; Galindo, March 17.

Sayornis saya (*Bonap.*).— 2 ♀: San Fernando, Oct. 26; Matamoros, Nov. 6.

Myiarchus crinitus crinitus (*Linn.*).— 2, both sexes: Yerba Burna, Sept. 29; Montelunga, Oct. 13.

Myiarchus magister nelsoni *Ridgway.*— 4, both sexes: Yerba Burna, Sept. 29; Portrero, Sept. 24; Matamoros, Aug. 13; Carricitos, Oct. 14.

Myiarchus lawrenci lawrenci (*Giraud*).— 18, both sexes: Altamira, Jan. 1; Yerba Burna, Sept. 30; Montelunga, Oct. 12; Galindo, Oct. 4; Altamira, Jan. 1; Rio Martinez, Feb. 25–27; Rio Cruz, June 28–July 8; Santa Leonor, April 3–12.

Myiodynastes luteiventris *Sclater.*— 1 ♀, Galindo, April 26.

Pitangus sulphuratus derbianus (*Kaup*).— 20, both sexes: Altamira, Dec. 13–25; Guiaves, Sept. 21; Rio Martinez, Feb. 25–March 1.

Tyrannus melancholicus couchii (*Baird*).— 7, both sexes: Altamira, Dec. 14–31; Santa Leonor, Sept. 11–12; Matamoros, Aug. 30; San Fernando, Oct. 19.

Muscivora forficata (*Gmel.*).— 21, both sexes, San Fernando, Oct. 19–29.

ALAUDIDÆ.

Otocoris alpestris giraudi *Henshaw.*— 8, both sexes, Matamoros, Aug. 21–29.

MIMIDÆ.

Toxostoma longirostre sennetti (*Ridgway*).— 5, both sexes: Matamoros, Nov. 2–20; Altamira, Dec. 10; Galindo, March 17; Rio Cruz, June 20.

Toxostoma curvirostre curvirostre (*Swains.*).— 11, both sexes: Matamoros, Nov. 3–Dec. 6.

Dumetella carolinensis (*Linn.*).— 2, both sexes, Altamira, Dec. 13.

Mimus polyglottos leucopterus (Vigors).— 1 ♂, Matamoros, Nov. 6.

TURDIDÆ.

Catharus mexicanus smithi *Nelson.*— 25, both sexes: Galindo, Oct. 4–April 20; Rampahuila, Sept. 27; Montelunga, April 26–29; Realito, May 22–June 11.

Remarks.— This form, which belongs to these mountains, was described by Nelson from a single specimen. It differs but slightly from true *mexicanus* of the uplands of Vera Cruz, one of the rarest of Mexican birds.

Catharus occidentalis fulvescens *Nelson.*— 7, both sexes, Galindo, March 17–April 24.

Hylocichla guttata guttata (*Pallas*).— 3, both sexes: Santa Leonor, March 10; Rio Martinez, March 2; Galindo, March 25.

Hylocichla guttata nana (*Aud.*).— 3, both sexes, Oct. 11–28.

Hylocichla guttata sequoiensis (*Belding*).— 7, both sexes: Galindo, March 17–25, April 20; Montelunga, April 26.

Hylocichla guttata auduboni (*Baird*).— 10, both sexes: Galindo, March 16–26; Montelunga, Oct. 11.

Hylocichla ustulata swainsoni (*Cabanis*).— 1 ♂, Galindo, April 24.

Planesticus migratorius propinquus (*Ridgway*).— 9, both sexes: 3, Galindo, March 15–22; 6, Realito, May 30–June 16 (only 2 males).

Remarks.— The resident birds of this region average a little smaller than true *propinquus* as recognized by Ridgway in 'Birds of North and Middle America.' Average length of wing of seven females 126, of two males 130. The series also averages a little paler than true *propinquus*, and possibly there is sufficient difference to warrant separation.

Planesticus grayi tamaulipensis (*Nelson*).— 6, both sexes: Galindo, March 16–April 22; Realito, May 31–June 5.

Sialia sialis fulva *Brewster.*— 15, both sexes: Montelunga, Oct. 13–April 29; Carricitos, Oct. 15–16; Yerba Burna, Sept. 30; Rampahuila, Sept. 27; Galindo, Oct. 3–March 27; Realito, May 29–June 1.

Myadestes obscurus occidentalis *Stejneger.*— 5, both sexes: Montelunga, Sept. 25–April 30; Realito, June 11; Santa Leonor, April 5

SYLVIIDÆ.

Regulus calendula calendula (*Linn.*).— 15, both sexes: Matamoros, Nov. 26–29; Guiaves, Sept. 15; Altamira, Dec. 10–14; Galindo, March 23–24; Santa Leonor, March 9–11.

Polioptila cærulea cærulea (*Linn.*).— 15, both sexes: Carricitos, Oct. 14; Guiaves, Sept. 17–20; Matamoros, Aug. 26–Nov. 28; Galindo

Oct. 2; Santa Leonor, Sept. 13; San Fernando, Oct. 25; Altamira, Dec. 11–12; Rio Martinez, March 3.

Remarks.— In this series the wing in the males runs from 50 to 54 mm. and in the females from 49 to 52 mm., thus all would appear to belong to the northern migratory form.

TROGLODYTIDÆ.

Heleodytes brunneicapillus couesi (*Sharpe*).— 3, both sexes, Matamoros, Dec. 3–6.

Heleodytes narinosus spec. nov.

6, both sexes: Carricitos, Oct. 15; Galindo, Oct. 1–March 22; Guiaves, Oct. 6–9.

Type from Galindo, Tamaulipas, Mexico; adult ♀, No. 49964, Mus. Comp. Zoöl. Collected March 22, 1909, by F. B. Armstrong.

Characters.— Similar to *H. jocosus* (Sclater) of Oaxaca City, Mexico, but differing in having a much shorter and stouter bill, the spots below smaller and less numerous; flanks much less distinctly barred with dusky. The nestling plumage shows the underparts practically unspotted, whereas in the nestling of *H. jocosus* the underparts are thickly covered with small dusky spots.

Measurements. (Four adults.)

	Wing.	Tail.	Tarsus.	Culmen.	Breadth of bill at mid nostril.
♂	72	58	24	20	5
♂	69	67	25	16	4
♀	75	66	24	20	5
♀	66	59	23	18	4

It appears from the small series available that this bird is very distinctly different from *H. jocosus* of the western slope of Mexico.

Pheugopedius maculipectus maculipectus (*Lafr.*).— 24, both sexes: Guiaves, Sept. 20; Rio Cruz, Sept. 10–July 15; Santa Leonor, March 7–April 13.

Thryothorus ludovicianus berlandieri (*Baird*).— 25, both sexes: Galindo, Oct. 5–March 23; Santa Leonor, Sept. 13–April 21; Guiaves, Oct. 6–7; Rampahuila, Sept. 28; Rio Cruz, July 19–22; Realito, May 29–June 3.

Thryothorus ludovicianus lomitensis *Sennett.*— 6, both sexes: Matamoros, Aug. 28–Nov. 29; San Fernando, Oct. 19–25.

Thryomanes bewickii cryptus *Oberholser.*— 23, both sexes: Matamoros, Aug. 18–Dec. 6; San Fernando, Oct. 21; Guiaves, Sept. 18.

Troglodytes aëdon parkmani *Aud.*— 14, both sexes: Matamoros, Oct. 10–Nov. 29; Montelunga, Oct. 10–April 29; San Fernando, Oct. 29; Realita, May 27–June 13; Galindo, March 15.

Troglodytes brunneicollis cahooni *Brewster.*— 9, both sexes, Galindo, March 14–26.

Nannorchilus leucogaster leucogaster (*Gould*).— 1 ♂, Altamira, Jan. 1.

CERTHIIDÆ.

Certhia familiaris albescens *Berlepsch.*— 11, both sexes: Galindo, Oct. 3–March 25; Montelunga, Oct. 11–April 27; Realito, May 23–June 10.

SITTIDÆ.

Sitta carolinensis mexicana *Nelson & Palmer.*— 1 ♂, Galindo, March 25.

PARIDÆ.

Bæolophus atricristatus atricristatus (*Cassin*).— 27, both sexes: Matamoros, Aug. 15–Nov. 25; Guiaves, Sept. 15–20; Santa Leonor Sept. 11–March 15; San Fernando, Oct. 21–25; Rio Martinez, March 3–26.

Bæolophus wollweberi wollweberi (*Bonap.*).— 21, both sexes: Rampahuila, Sept. 28–29; Yerba Burna, Sept. 29; Carricitos, Sept. 30–Oct. 14; Montelunga, Sept. 25; Galindo, Oct. 3–March 22; Guiaves, Oct. 6; Portrero, Sept. 24–Oct. 3.

Auriparus flaviceps flaviceps (*Sundevall*).— 6, both sexes: Matamoros, Aug. 23–Dec. 6.

CORVIDÆ.

Corvus mexicanus *Gmel.*— 8, both sexes: Santa Leonor, March 11-18; Rio Cruz, June 18–July 16.

Psilorhinus morio morio (*Wagler*).— 15, both sexes: Altamira, Dec. 17–Jan. 4; Santa Leonor, March 8–April 10; Rio Cruz, July 10–20; Guiaves, Sept. 15.

Remarks.— Four of the skins from Altamira approach very closely to *Psilorhinus morio fuliginosus* (Lesson) one of them being almost referable to that form, but all others from the same place (Altamira) are typical *P. morio morio.*

Xanthoura luxuosa glaucescens *Ridgway.*— 27, both sexes: Matamoros, Oct. 25–Dec. 13; San Fernando, Oct. 20–30; Rio Martinez, Feb. 26–March 3; Rio Cruz, June 1–2.

Aphelocoma sieberi couchi (*Baird*).— 17, both sexes: Carricitos, Oct. 15; Galindo, Oct. 4–March 26; Santa Leonor, Sept. 11; Realito, May 26–June 5.

LANIIDÆ.

Lanius ludovicianus excubitorides (*Swainson*).— 4, both sexes: Matamoros, Nov. 24–30; San Fernando, Oct. 24.

VIREONIDÆ.

Vireosylva olivacea (*Linn.*).— 1 ♂, Matamoros, Aug. 21.

Vireosylva gilva swainsoni (*Baird*).— 5, both sexes, Galindo, March 14–27.

Lanivireo flavifrons (*Vieillot*).— 1 ♂, Matamoros, Aug. 25.

Lanivireo solitarius solitarius (*Wilson*).— 10, both sexes: Galindo, Oct. 2; Guiaves, Sept. 17; San Fernando, Oct. 25; Montelunga, Oct. 11–April 27; Realito, May 30–June 6.

Remarks.— There are four breeding birds from Realito, May 30–June 6, and two from Montelunga, April 26–27. These are very close to northern specimens of true *solitarius*, though they differ slightly in the line of demarcation between the colors of the head and back being rather more sharply drawn, and the head slightly bluer. On the whole, however, we are surprised to find these local birds, breeding in the mountains of eastern Mexico so very close to migrants and northern examples. Four breeding males have a wing average of 72.5, while two breeding females have a wing average of 73.

Vireo atricapillus *Woodhouse.*— 1 ♂, Santa Leonor, April 12.

Vireo griseus griseus (*Boddaert*).— 4 ♂: San Fernando, Oct. 10; Altamira, Dec. 10–14.

Remarks.— These are wholly referable to the northern bird both in color and size.

Vireo griseus micrus (*Nelson*).— 30, both sexes: Matamoros, Aug. 20–Dec. 6; San Fernando, Sept. 16–Oct. 30; Guiaves, Sept. 14–21; Rio Santa, Sept. 8; Caballeros, Sept. 7; Santa Leonor, Sept. 11–April 2; Rio Martinez, March 3; Rio Cruz; Sept. 10; Altamira, Dec. 11–12.

Remarks.— In this large series the wing runs very constantly from 54 to 58 mm. Most of the specimens are extreme of this small, dull colored race, and have been so pronounced by Mr. Nelson, who examined some of them. A few, however, are not quite typical and may have migrated from an intermediate region.

Vireo huttoni mexicanus *Ridgway.*— 7: Yerba Buena, Sept. 29; Galindo, Oct. 4–March 27; Rampahuila, Sept. 28.

Vireo belli belli *Aud.*— 8: Guiaves, Sept. 18–22; Galindo, Oct. 5; Caballeros, Sept. 6; Rio Santa, Sept. 8.

HIRUNDINIDÆ.

Riparia riparia (*Linn.*).— 4, both sexes, Matamoros, Aug. 21–29.

Cheledon[1] **erythrogastra** (*Boddaert*).— 3 ♂, Matamoros, Aug. 18–Sept. 2.

MOTACILLIDÆ.

Anthus rubescens (*Tunstall*).— 4, both sexes: Matamoros, Nov. 27–30; Altamira, Dec. 14.

Anthus spraguei (*Aud.*).— 6, both sexes, Matamoros, Nov. 27–30.

MNIOTILTIDÆ.

Mniotilta varia (*Linn.*).— 12, both sexes: Matamoros, Aug. 21–Nov. 27; Altamira, Dec. 12; Guiaves, Sept. 18; Galindo, March 23–25.

Helinaia swainsoni *Aud.*— 1 ♀, Matamoros, Aug. 29.

Helmitheros vermivorus (*Gmel.*).— 1 ♂, Matamoros, Aug. 22.

Vermivora pinus (*Linn.*).— 1 ♂, Matamoros, Aug. 25.

Vermivora celata celata (*Say*).— 31, both sexes: Matamoros, Oct. 30–Dec. 6; Altamira, Dec. 10–12; San Fernando, Oct. 21–29; Galindo, March 25.

Remarks.— Some of these specimens may have come from an intermediate breeding ground, though none are quite referable to *V. c. lutescens.*

Vermivora rubricapilla rubricapilla (*Wilson*).— 9, both sexes: Matamoros, Oct. 11–Nov. 28; San Fernando, Oct. 19–22; Galindo, March 13–15; Rio Martinez, March 2; Montelunga, April 27.

Oreothlypis superciliosa (*Hartlaub*).— 24, both sexes: Rampahuila, Sept. 28; Montelunga, Sept. 25; Galindo, March 14–26; Realito, May 31–June 11.

Compsothlypis americana ramalinæ *Ridgway.*— 2, both sexes: Matamoros, Aug. 22; Altamira, Dec. 16.

Remarks.— Both these specimens appear to be referable to this subspecies.

Compsothlypis pitiayumi nigrilora (*Coues*).— 19, both sexes: Matamoros, Aug. 22; Altamira, Dec. 11–24; Caballeros, Sept. 6; Santa Leonor, Sept. 11–April 16; Guiaves, Sept. 20; Rio Cruz, May 7–June 8; Montelunga, April 27–30.

Peucedramus olivaceus (*Giraud*).— 8, both sexes: Montelunga, Oct. 11–April 27; Galindo, Oct. 4–March 25; Yerba Burna, Sept. 29; Realito, May 22–26.

Dendroica æstiva æstiva (*Gmel.*).— 4, both sexes: Rio Cruz, May 10; Guiaves, Sept. 14–19.

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[1] Cf. Hartert, Die Vögel der Paläarktischen Fauna, VI, June, 1910, p. 799.

Dendroica æstiva ineditus subsp. nov.

14, both sexes: Matamoros, Aug. 15–Sept. 3.

Type from Matamoros, Tamaulipas, Mexico; No. 49970, Mus. Comp. Zoöl. Adult ♂, collected Aug. 19, 1908, by F. B. Armstrong.

Characters.— Most nearly like *D. æ. dugesi* Coale, but slightly smaller, and the female very different in color, being bright yellow below, and dull greenish yellow above instead of grayish. Also somewhat similar to *D. æ. sonorana* Brewster in general coloration of the male, but much larger, and the female more brightly colored — yellower below and more greenish above.

This form, which probably occupies the whole coast region of northern Tamaulipas up to the Rio Grande Valley of Texas is strikingly different from the other geographical races of *D. æstiva*. It is at once distinguished from *D. æstiva æstiva* by larger size, duller and more yellowish coloration, with the crown of the male always dull yellow and the back always unstriped. It is larger than *D. æ. sonorana*, of western Mexico, and slightly different in color, especially the female. It is only slightly smaller than *D. æ. dugesi*, which form it also most nearly resembles in coloration, the males of the two being very nearly alike. The female, however, is wholly different from the female of *D. æ. dugesi* in color, being hardly distinguishable in this respect from the female of *D. æstiva æstiva*, from which its greater size separates it at once.

No.	Sex.	Wing.	Tail.	Tarsus.	Culmen.
49970	♂	65	45	18	9
49971	♂	65	45	18	11
49977	♂	66	47	18	10
49978	♂	65	44	18	10
49974	♂	62	45	17	10
49973	♂	64	44	16	10
49972	♂	63	45	18	11
49976	♂	63	47	18	10
49975	♂	62	43	17	10
49979	♀	60	43	18	10
49981	♀	61	44	17	10
49980	♀	61	42	17	10
A	♂	64	44	17	10
B	♀	59	44	17	10

Dendroica coronata (*Linn.*).— 12, both sexes: Matamoros, Nov. 10–Dec. 5; Altamira, Dec. 12–15; Galindo, March 15–23.

Dendroica auduboni auduboni (*Townsend*).— 9, both sexes: Matamoros, Dec. 1; San Fernando, Oct. 22; Galindo, March 14–23.

Dendroica townsendi (*Townsend*).— 2, both sexes, Montelunga Oct. 10 and April 30.

Dendroica virens (*Gmel.*).— 23, both sexes: San Fernando, Oct. 25–26; Altamira, Dec. 14–31; Galindo, March 14–April 19; Santa Leonor, March 10–April 14; Montelunga, April 26–28.

Dendroica chrysoparia *Sclater & Salvin.*— 3, both sexes, Galindo, March 14–22.

Dendroica occidentalis (*Townsend*).— 2, both sexes: Guiaves, Oct. 7; Galindo, March 19.

Dendroica dominica albilora *Ridgway.*— 1 ♂, Guiaves, Sept. 18.

Remarks.— This specimen is not quite typical, having too large a bill, and the character of the outer tail feathers about intermediate between *D. d. dominica* and *D. d. albilora*.

Oporornis formosa (*Wilson*).— 3, both sexes, Matamoros, Aug. 26–Sept. 2.

Oporornis philadelphia (*Wilson*).— 11, both sexes: Matamoros, Aug. 16–31; Guiaves, Sept. 22.

Oporornis tolmiei (*Townsend*).— 1 ♂, Rio Cruz, May 12.

Seiurus aurocapillus (*Linn.*)— 2, both sexes: San Fernando, Oct. 28; Montelunga, April 26.

Seiurus motacilla (*Vieillot*).— 1 ♂, Guiaves, Sept. 18.

Geothlypis trichas brachidactyla (*Swainson*).— 21, both sexes: Matamoros, Aug. 14–27 and Nov. 23, including one ♀ still in nestling plumage (Aug. 14); San Fernando, Oct. 30–31; Altamira, Dec. 11–15; Rio Cruz, May 6–12.

Remarks.— If true *G. trichas* and *G. trichas brachidactyla* are kept distinct as was done by Ridgway, these skins will all go rather better with *brachidactyla*.

Icteria virens virens (*Linn.*).— 12, both sexes: Matamoros, Aug. 10–Sept. 3; Rampahuila, Sept. 26; Caballeros, Sept. 6; Altamira, Dec. 12.

Wilsonia pusilla pusilla (*Wilson*).— 5, both sexes: Rio Santa, Sept. 8; Matamoros, Aug. 31; Guiaves, Sept. 14–20; Altamira, Dec. 12.

Wilsonia pusilla pileolata (*Pallas*).— 25, both sexes: Guiaves, Sept. 12–18; Rio Martinez, Sept. 9–Feb. 24; Altamira, Dec. 11–Jan. 1; Galindo, March 18–25; Santa Leonor, March 8–9; Rio Cruz, Jan. 20–July 22.

Wilsonia canadensis (*Linn.*).— 11, both sexes; Matamoros, Aug. 19–Sept. 1.

Setophaga picta picta (*Swainson*).— 12, both sexes: Rampahuila, Sept. 26–27; Portrero, Sept. 24; Rio Martinez, Feb. 27; Galindo, March 15–23; Realito, May 23–June 3.

Euthlypis lachrymosa lachrymosa *Cabanis.*— 1 ♂, Santa Leonor, April 3.

Basileuterus belli belli (*Giraud*).— 6, both sexes: Montelunga, Oct. 11; Rampahuila, Sept. 26; Carricitos, Oct. 14; Galindo, Oct. 1.

Basileuterus rufifrons jouyi *Ridgway.*— 43, both sexes: Galindo, Oct. 1–March 23; Guiaves, Sept. 25–Oct. 8; Montelunga, Sept. 25–Oct. 13; Yerba Burna, Sept. 29–30; Rampahuila, Sept. 26–28; Santa Leonor, March 7–April 7; Rio Cruz, June 15–July 20.

Basileuterus culicivorus brasheri (*Giraud*).— 54, both sexes: Santa Leonor, Sept. 12–April 11; Caballeros, Sept. 6–7; Guiaves, Sept. 17–22; Rio Martinez, March 1; Rio Cruz, June 19–July 17.

ICTERIDÆ.

Molothrus ater ater (*Boddaert*).— 2 ♀, Matamoros, Nov. 26.

Remarks.— Typical of the eastern race.

Megaquiscalus major macrourus (*Swainson*).— 4 ♂, Matamoros, Nov. 17–21.

Icterus melanocephalus auduboni (*Giraud*).— 15, both sexes: Galindo, Oct. 2–4; San Fernando, Oct. 19; Altamira, Jan. 1; Rio Martinez, March 1–Feb. 27; Santa Leonor, April 1; Rio Cruz, June 27–July 7; Realito, June 7–13.

Icterus gularis tamaulipensis *Ridgway.*— 11, both sexes: Altamira, Dec. 8–24; Santa Leonor, Sept. 12; Guiaves, Sept. 15.

Icterus cucullatus sennetti *Ridgway.*— 3, both sexes, Matamoros, Aug. 24–29.

Icterus galbula (*Linn.*).— 4, both sexes: Santa Leonor, Sept. 11–13; Galindo, Oct. 1; Guiaves, Sept. 17.

Icterus bullocki (*Swainson*).— 5, both sexes: Guiaves, Sept. 16–Oct. 6; Galindo, Oct. 4; Yerba Burna, Sept. 30; Montelunga, April 27.

Agelaius phœniceus richmondi *Nelson.*— 18, both sexes: Matamoros, Aug. 23–Nov. 28; San Fernando, Oct. 20–25.

Sturnella neglecta *Aud.*— 4 ♀, Matamoros, Nov. 19–25.

TANGARIDÆ.

Piranga rubra rubra (*Linn.*).— 5, both sexes: Matamoros, Aug. 26–27; Carricitos, Oct. 15; Rio Martinez, Feb. 24; Galindo, April 20.

Piranga hepatica dextra *Bangs.*— 36, both sexes: Matamoros, Nov. 9; Rampahuila, Sept. 26–28; Galindo, Oct. 1–March 26; Carricitos, Oct. 15; Montelunga, Oct. 12; Realito, May 22–June 8.

Piranga bidentata sanguinolenta (*Lafr.*).— 21, both sexes: Galindo, March 15–25; Realito, April 20–June 13; Montelunga, April 31.

FRINGILLIDÆ.

Loxia curvirostra stricklandi *Ridgway.*— 2 ♂, Galindo, March 20–27.

Spinus pinus pinus (*Wilson*).— 5, both sexes, Galindo, March 15–April 29.

Astragalinus tristis pallidus (*Mearns*).— 1 ♂, Santa Leonor, March 9.

Astragalinus psaltria psaltria (*Say*).— 9, both sexes (one young ♀, Galindo, Oct. 1, has no white whatever on the tail; another young ♀ has only a trace of it): Galindo, Oct. 1; Rampahuila, Sept. 26–28; Yerba

Burna, Sept. 29–30; Guiaves, Oct. 7; Montelunga, Oct. 13; Rio Martinez, March 4.

Passer domesticus (*Linn.*).— 1 ♀, Matamoros, Aug. 17.

Calamospiza melanocorys *Stejneger.*— 3 ♂, Matamoros, Nov. 27–Dec. 1.

Spiza americana (*Gmel.*).— 5, both sexes, Matamoros, Aug. 18–26.

Chondestes grammacus strigatus (*Swainson*).— 12, both sexes. Matamoros, Aug. 28–Dec. 4; San Fernando, Oct. 16; Montelunga, April 26; Rio Cruz, July 1.

Poœcetes gramineus gramineus (*Gmel.*).— 3, both sexes, Matamoros, Nov. 5–Dec. 2.

Passerculus sandwichensis savanna (*Wilson*).— 6, both sexes: Matamoros, Nov. 7–20.

Remarks.— These specimens comprise a rather puzzling series, with some probable intermediates.

Passerculus sandwichensis alaudinus (*Bonaparte*).— 8, both sexes: Matamoros, Nov. 7–Dec. 3; Altamira, Dec. 15; San Fernando, Oct. 25.

Ammodramus savannarum australis *Maynard.*— 2 ♂: Altamira, Dec. 12; Galindo, March 17.

Aimophila ruficeps eremœca (*Brown*).— 3 ♂, Guiaves, Oct. 7–9.

Aimophila ruficeps boucardi (*Sclater*).— 23, both sexes, young and adults: Rampahuila, Sept. 26–28; Carricitos, Oct. 15; Guiaves, Oct. 6–9; Montelunga, Oct. 10–April 29; Yerba Burna, Sept. 30; Galindo, March 15–April 18; Realito, May 22–June 6.

Remarks.— Most of the specimens listed above are typical of *boucardi* though some few appear to be somewhat intermediate between this and *eremœca*.

Aimophila cassini (*Woodhouse*).— 8, both sexes: Matamoros, Aug. 17–Nov. 25.

Aimophila botterii botterii (*Sclater*).— 9, both sexes: Matamoros, Aug. 13–Sept. 13.

Amphispiza bilineata bilineata (*Cassin*).— 25, both sexes: Matamoros, Aug. 18–Dec. 5; San Fernando, Aug. 24–27.

Junco phæonotus phæonotus *Wagler.*— 3, both sexes: Galindo, March 20–27.

Spizella passerina arizonæ *Coues.*— 30, both sexes: Santa Leonor, April 4; Montelunga, April 27; Galindo, March 14–April 19.

Remarks.— Most of these skins are typical of this form, though a few somewhat approach *mexicana*, none, however, being quite referable to it.

Spizella pusilla arenacea *Chadbourne.*— 5 ♂, Matamoros, Nov. 9–Dec. 3.

Spizella pallida (*Swainson*).— 10, both sexes: Matamoros, Nov. 4–Dec. 1; San Fernando, Oct. 30.

Zonotrichia leucophrys leucophrys (*Forster*).— 12, both sexes, Matamoros, Nov. 4–Dec. 1.

Zonotrichia leucophrys gambeli (*Nuttall*).— 1 ♂, Matamoros, Nov. 25.

Melospiza lincolni lincolni (*Aud.*).— 20, both sexes: San Fernando, Oct. 22–30; Altamira, Dec. 17–18; Matamoros, Nov. 20–27; Galindo, March 14–29; Santa Leonor, March 8–April 14.

Pipilo maculatus montanus *Swarth.*— 1 ♂, Galindo, March 15.

Arremonops rufivirgatus rufivirgatus (*Lawrence*).— 32, both sexes: Matamoros, Aug. 21–Dec. 1; Guiaves, Sept. 14–21; Rio Cruz, Sept. 10–July 7; Rio Santa, Sept. 8; San Fernando, Oct. 30; Caballeros, Sept. 7; Altamira, Dec. 10–15; Rio Martinez, Feb. 24–March 4.

Atlapetes pileatus dilutus *Ridgway.*— 37, both sexes: Guiaves, Oct. 6–8; Montelunga, Oct. 12; Yerba Burna, Sept. 29; Carricitos, Oct. 15–16; Galindo, Oct. 3–March 26; Portrero, Sept. 24; Rampahuila, Sept. 28; Realito, May 23–June 2.

Sporophila morelleti sharpei *Lawrence.*— 8, both sexes: Matamoros, Aug. 21–Nov. 24; Altamira, Dec. 17.

Passerina cyanea (*Linn.*).— 2 ♀, San Fernando, Oct. 21–23.

Passerina ciris (*Linn.*).— 4, both sexes: Matamoros, Aug. 24–25; San Fernando, Oct. 27; Altamira, Dec. 15.

Passerina versicolor versicolor (*Bonap.*).— 6, females and young males: Matamoros, Aug. 23–27; Guiaves, Sept. 16–Oct. 7.

Cyanocompsa parellina parellina (*Bonap.*).— 26, both sexes: Guiaves, Sept. 20–April 31: Carricitos, Oct. 15; Rio Martinez, Feb. 24; Rio Cruz, Jan. 20–July 1; Altamira, Dec. 10–Jan. 1; Santa Leonor, March 10–April 12.

Guiraca cærulea cærulea (*Linn.*).— 2 ♀, Montelunga, Oct. 10; Rio Cruz, July 8.

Zamelodia melanocephala (*Swainson*).— 1 ♀, Galindo, March 14.

Pyrrhuloxia sinuata texana *Ridgway.*— 9, both sexes: Matamoros, Nov. 3, Dec. 3–Feb. 24.

Cardinalis cardinalis canicaudus *Chapman.*— 38, both sexes: San Fernando, Oct. 20–23; Matamoros, Nov. 3–26; Altamira, Dec. 12–24; Rio Martinez, Feb. 25–March 5; Santa Leonor, March 7–April 15; Rio Cruz, June 23–26.

Remarks.— In 'Birds of North and Middle America' Ridgway gives the range of *C. cardinalis coccineus* as extending north to Altamira. Five skins, one female and four males from Altamira in the above series are, however, distinctly referable to *C. cardinalis canicaudus*, the females having the same pale, grayish capistrum, and a small bill, very different from the deep black capistrum and heavy bill of *coccineus*.

The males approach *coccineus* somewhat in the color of the back, the gray edging to the feathers being more reduced than in northern specimens, but otherwise, in their small bills and the color of the underparts, they are similar to skins from Matamoros and other northern points in Tamaulipas.

Rhodothraupis celæno (*Licht.*). 17, both sexes: Rio Santa, Sept. 8; Yerba Burna, Sept. 30; Rio Martinez, Feb. 23–26; Santa Leonor, March 7–April 15; Rio Cruz, May 1–July 10; Guiaves, May 4

CONCERNING THE NUPTIAL PLUMES WORN BY CERTAIN BITTERNS AND THE MANNER IN WHICH THEY ARE DISPLAYED.

BY WILLIAM BREWSTER.

CHIEF among the natural attractions of Concord, Massachusetts, is its charming little river, known as the Sudbury above the point where, near the village center, it unites with the Assabet, and below this as the Concord. The Indians called it the Musketequid or Grass-grown River, a name not less appropriate than euphonious, for its sluggish waters abound in aquatic or semi-aquatic vegetation and its banks are fringed with wild grasses and sedges which stretch for miles along one or both sides of the placid, sinuous stream and in places also extend back to a greater or less distance over low, flat lands wet at all seasons and regularly inundated in early spring. These fresh-water marshes are of vast extent in Sudbury and Wayland and they cover hundreds of acres in the eastern part of Concord where they have been known, ever since the first settlement of the town, as the Great Meadows and where I am especially familiar with them for I am accustomed to spend much time in spring and autumn at a camp on Ball's Hill that directly overlooks them. Among the birds which frequent them at these seasons and in summer, the American Bittern is one of the commonest and most conspicuous as well as most interesting. I have had so many opportunities of watching it here and elsewhere that I had come to doubt if there could be anything more of importance for me to learn regarding its life history when, only last April, I was not a little surprised — and also a bit humiliated — to find that during the mating season the male bird indulges in certain odd and interesting displays of plumage of which I had been wholly ignorant. The following account of this experience is taken, with few changes, from my journal where I wrote it out in full just after making the observations to which it relates.

Concord, Massachusetts. April 17, 1910. Brilliantly clear and bracingly cool with strong, keen east wind.

The marsh on the south side of the river opposite Ball's Hill

looks, at present, almost as smooth and verdant as a well kept lawn. It was mown over late last summer and having been free from flood water for upwards of a month past, is now covered everywhere with young grass three or four inches in height. Although this affords no concealment for birds larger than a Snipe the marsh has been frequented much of late by Bitterns. At morning and evening I have heard them pumping or have seen them flying to and fro, or standing erect with heads and necks stretched up on the watch for danger, but previous to to-day I have paid little attention to them. Two which I saw this morning, however, presented such a strange appearance and acted in so remarkable a manner that I watched them for half-an-hour or more with absorbing interest. When I first noticed them they were on the further margin of a little lagoon where Red-winged Blackbirds breed, moving past it eastward almost if not quite as fast as a man habitually walks, one following directly behind the other at a distance of fifteen or twenty yards. Thus they advanced, not only rapidly but also very evenly, with a smooth, continuous, gliding motion which reminded me of that of certain Gallinaceous birds and was distinctly un-heron-like. Occasionally they would stop and stand erect for a moment but when walking they invariably maintained a crouching attitude, with the back strongly arched, the belly almost touching the ground, the neck so shortened that the lowered head and bill seemed to project only a few inches beyond the breast. In general shape and carriage, as well as in gait, they resembled Pheasants or Grouse much more than Herons. But the strangest thing of all was that both birds showed extensive patches of what *seemed to be pure white* on their backs, between the shoulders. This made them highly conspicuous and led me to conclude at first that they must be something quite new to me and probably — because of their attitudes and swift, gliding movements — Pheasants of some species with which I was unfamiliar. Thus far I had been forced to view them with unassisted eyesight, but when I had reached the cabin and they the edge of our boat canal directly opposite it I got my opera glass and by its aid quickly convinced myself that despite their unusual behavior and the white on their backs they could be nothing else than Bitterns.

I was now joined by Miss E. R. Simmons, Miss Alice Eastwood (the California botanist) and my assistant Mr. R. A. Gilbert, all of whom became at once deeply interested in the birds which had stopped and were standing erect by the canal about twenty yards apart. Suddenly both rose and flew straight at one another, meeting in the air at a height of four or five feet above the marsh. It was difficult to make out just what happened immediately after this but we all thought that the birds came together with the full momentum of rapid flight and then, clinching in some way, apparently with both feet and bills, rose six or eight feet higher, mounting straight upward and whirling around and around, finally descending nearly to the ground. Just before reaching it they separated and sailed (not flapped) off to their former respective stations. After resting there a few minutes the mutual attack was renewed in precisely the same manner as at first only somewhat less vigorously. It was not repeated after this. Although a most spirited tilt (especially on the first occasion), by antagonists armed with formidable weapons (the dagger-like bills), we could not see that any harm resulted from it to either bird. When we crossed the river in a boat some fifteen minutes later both Bitterns were still standing near the canal. Up to this time both had shown the white continuously but it *disappeared* as we were approaching them. One took flight when we were in the middle of the river. We got within twenty yards of the other before it moved and then it merely walked off over the marsh.

Concord, April 18, 1910. Cloudy with fine, steady rain. Forenoon cool with chill east wind; afternoon warm with light south wind.

A close watch was kept for the Bitterns during the forenoon but nothing was seen of them until afternoon when, about two o'clock, both birds appeared in the marsh on the eastern side of the canal. Mr. H. A. Purdie was now with me. He, Gilbert and I had the Bitterns under observation for more than an hour. During this time they rambled about over several acres of the lawn-like marsh keeping, for the most part, however, near the edge of the river here about one hundred and fifty yards in width. They indulged in no tilting on this occasion nor once approached each other nearer than thirty yards while not infrequently they

were more than twice that distance apart. As was the case yesterday they carried their bodies very low and at times so flattened to the ground that they resembled big, swift-crawling tortoises rather than birds, as they wound in and out among the tufts of grass for on this occasion they pursued devious courses which usually ended near the starting point. They did not seem to be looking for food but rather to be inspired by restlessness and also by a spirit of rivalry. As both "pumped" at frequent intervals I concluded that both must be males. There was much connected with their behavior which suggested that they were chiefly engaged in "showing off" apparently to each other, solely, for if there was a female anywhere near at hand we failed to see her. Whenever one of them "pumped" the other was sure to respond within two or three seconds, sometimes facing his rival, sometimes turning in another direction. During most of the time when they were in the marsh together both birds showed the white which we saw yesterday but when one of them finally flew away the other ceased altogether to display it although we had him in view for some twenty minutes longer during which time he "pumped" repeatedly. The white was seen much better and for a longer period to-day than yesterday and I was able to check, as well as supplement, my own observations by those of Purdie and Gilbert both of whom were with me the whole time and paying equally critical attention to the matter. At first we disagreed with respect to certain minor details but all such difference of opinion was finally harmonized and what I am about to record is now subscribed to by all three of us.

The white first appears at or very near the shoulders of the folded wings and then expands, sometimes rather quickly (never abruptly, however) but oftener very slowly until, spreading simultaneously from both sides, it forms two ruffs apparently almost if not quite equal in length and breadth to the hands of a large man but in shape more nearly resembling the wings of a grouse or quail held with the tips pointing sometimes nearly straight upward, sometimes more or less backward, also. As they rise above the shoulders these ruffs spread toward each other at right angles to the long axis of the bird's body until, at their bases, they nearly meet in the centre of the back. Sometimes they are held thus

without apparent change of area or position for many minutes at a time, during which the bird may move about over a considerable space or perhaps merely stand or crouch in the same place. We frequently saw them fully displayed when the Bitterns were "pumping" but not then more conspicuously, or in any different way, then than at other times. When the bird was moving straight towards us with his body carried low and his ruffs fully expanded he looked like a big, white rooster having only the head and breast dark colored, the breast often looking nearly black. For in this aspect and at the distance at which we viewed him (perhaps two hundred yards) the broad ruffs, rising above and reaching well out on both sides of the back and shoulders, completely masked everything at their rear while the head and the shortened neck, being carried so low that they were seen only against the breast, added little or nothing to the visible area of dark plumage. When he was moving away from us in the same crouching attitude the ruffs looked exactly like two white wings — nearly as broad as those of a domestic Pigeon but less long — attached to either side of the back just above the shoulders. When we had a side view of him the outline of the ruffs was completely lost and there seemed to be a band of white as broad as one's hand, extending between the shoulders quite across the back. Thus whichever way he moved or faced the white was always shown, most conspicuously, however, when he turned towards us. It did not ever look dull or faint, or even yellowish, whether seen in bright sunlight, as on the morning of the 17th, or under dark lowering skies, as on the afternoon of the 18th. On the contrary, at all times and under all conditions, when we saw it at all, it appeared to be *pure* white. When the Bittern was rambling through short, rich-green grass or over blackish mud, the white was often the only thing we could see. It made an odd impression on the mind as it moved about without visible means of propulsion and had we not known just what it was we should certainly have been sorely puzzled to account for it. When the bird was standing or crouching motionless the white might easily have been mistaken for a small patch of snow or for a good-sized sheet of writing paper lying in the marsh. It was so very conspicuous that anyone looking out casually over the marsh could not have failed to notice it at the first glance. As

I have said it opened out rather slowly as a rule and never very abruptly. Its disappearance was effected in a correspondingly deliberate manner.

On reaching home late this afternoon I at once examined all the Bitterns in my collection. Most of them are females or males killed in autumn, none of which have pronounced white or whitish anywhere about the wings. But four adult males taken in spring possess tufts of yellowish white feathers, soft and more or less downy in texture, which are attached to the sides of the breast under the shoulders. By erecting and spreading these feathers I have been able to produce something resembling what we saw in Concord. The Concord birds, however, apparently had plumes *more than double* the size of those possessed by any of my skins and pure, not yellowish, white. When I gave an account of the matter at a meeting of the Nuttall Club this evening one of the members (Mr. Freeman) suggested that the Bittern may inflate the skin to which the plumes are attached, thus causing them to stand out further than they can be made to do in the dried skin. Even if this be so I doubt if feathers no longer or more numerous than those of my specimens could expand into the broad, full, snowy ruffs shown by the Bitterns seen yesterday and today at Concord. It is conceivable, of course, that the ruffs displayed by the living birds were less large and white than they appeared. I should suspect that this may have been the case were it not that the observations I have just noted were made with care by *five different persons* and under widely varying conditions of light and shade. Hence I have felt justified in recording our mutual impressions of what we saw despite the fact that my skins of Bitterns do not seem to altogether confirm them.

Concord, April 20, 1910. Clear and warm with fresh southwest wind.

I returned to Concord late this afternoon provided with a gun and determined to kill a Bittern if I could get a shot at one that showed white ruffs. Three males began pumping about six o'clock. Two of them were far out in the open meadows. The third, at the edge of the river, was accompanied by a smaller, duller plumaged bird which, without doubt, was a female and his mate. I watched this pair for more than half an hour. The male pumped at fre-

quent intervals but showed no white. The female was within twenty yards of him most of the time and for ten or fifteen minutes within three yards. He invariably faced her and she him when he was pumping but neither bird seemed in the least moved by sexual ardor or excitement or did anything especially suggestive of courtship. Indeed both behaved quite after the usual manner of their kind and altogether differently from the Bitterns seen on the 17th and 18th. When they walked it was with dignified slowness, carrying themselves rather erect and lifting and putting down their feet with marked deliberation. They crouched a few times over a pool of water remaining there for many minutes, evidently on the watch for prey, in poses closely similar to those assumed by Night Herons and Great Blue Herons when similarly engaged. Once the female plunged her head under water and drew out something which she first shook violently and then swallowed. Very much of the time she stood motionless with her bill pointing straight upward, her neck elongated and her body plumage so compressed that head, neck and body appeared all of about the same thickness and not much stouter than a man's wrist. When in this attitude she looked almost exactly like a stake, a yard or so in length, rising straight out of the marsh and of a weathered grayish color. The male did precisely the same thing but less often and for shorter periods. It was evident that both birds were apprehensive of danger of some kind and almost constantly on the watch for it. Indeed they seemed even more alert and suspicious than the Great Blue Heron or the Great White Egret often does, when seen under similar conditions. I was somewhat surprised at this and altogether delighted by their wonderful grace of form and movement. During the time I had them under observation they moved onward in a nearly straight course along the edge of the river but so very slowly that the total distance covered was less than forty yards. At length the male rose and flew down river two or three hundred yards. Although he pumped a number of times in this new station the female did not follow him.

Concord, April 21, 1910. Sunny but hazy; forenoon calm; fresh east wind in afternoon.

I spent almost the entire day watching Bitterns. There were two males pumping in the Great Meadows, sometimes within fifty

yards of one another, sometimes two hundred to three hundred yards apart. Whenever they approached one another they acted like the two seen on the 17th and 18th, crawling or gliding about over the meadow and showing their ruffs more or less constantly and conspicuously. One appeared to have small, yellowish ruffs, the other large, pure white ones. I tried in vain to get a shot at them. It was simply impossible to stalk them for there was no cover of any kind and they would not permit me to approach them nearer than one hundred yards before taking wing. They never once attempted to hide but merely stood looking at me until they thought I was getting dangerously close when they would fly to a distant part of the meadow, returnimg to their original stations whenever I went back to my canoe.

Among the members of the Nuttall Club present at the meeting when I gave an account of some of the observations above described was my friend and neighbor Mr. Charles R. Lamb. Shortly afterwards he visited Cape Cod to obtain a few shore birds for his collection. During this trip he had an opportunity of seeing a Bittern display its white ruffs and of examining them just after the bird was killed. He has since been kind enough to place at my disposal his written notes relating to this experience. Their testimony is, in part, as follows:—

"Late in the afternoon" of May 27, 1910, Mr. Lamb was sitting in a shooting stand in a marsh at East Orleans, Massachusetts, when he noticed a Bittern "about 100 to 150 yards" away, "standing very erect, with bill pointed up, looking like a stick." Shortly after this it "lowered the feathers of the neck, bent the neck a little and started to walk off, at the same time throwing out the white feathers at the shoulder, over the wing. These feathers stood out straight from the body at first, then seemed to extend backward," being "apparently all white" and forming "a conspicuous wing-shaped thing on the back above the wing, which looked about the size of" one's "hand, possibly not quite as long." As no other Bittern was in sight Mr. Lamb "could see no reason for the display of the white feathers unless it was due" to apprehension or alarm caused by his own presence. After watching the bird for several minutes he approached it by crawling on hands and knees through the grass and shot it, just as it took wing.

He "did not feel sure it was a Bittern until it flew" for its general coloring, "as seen through the glasses, looked dark bluish instead of brown." On examining this specimen just after killing it he found that the white feathers "appeared" to be attached "at the point where" the humerus enters "the body and as near the back as the breast." They "could easily be thrown out above the wing which was evidently done" by the living bird. On each side of the breast there were "about eight pure white feathers of a downy or fluffy quality and two or more nearly all white but with some brown near the shafts." This Bittern proved, on dissection, to be a male.

Since the above notes were made I have examined upwards of fifty skins of the American Bittern preserved in collections other than my own. On the strength of this and previous investigation I base the following generalizations respecting the light colored tufts of feathers which — for lack of a better name — I have called ruffs. (1) They are, as has been said, attached to the skin on each side of the breast near where the humerus enters the body and beneath the shoulder of the folded wing by which they are ordinarily concealed. (2) They are soft and fluffy in character and on the whole more nearly like down than like ordinary contour plumage although they often include typical feathers, rather large and well developed. (3) They vary in color from creamy white to light buffy or yellowish; the larger and broader feathers are commonly plain like the rest but sometimes they have narrow shaft stripes of rich reddish brown. (4) Although usually present in adult males killed in April, May or June they are entirely wanting or but very slightly developed in a few such birds — representing perhaps ten per cent of those which I have seen. (5) Autumnal specimens of both sexes and apparently all ages are almost, if not quite, invariably without them. (6) I have seen only one female (a breeding bird) which showed any traces (and these but slight) of them.

Concealed tufts of light-colored, downy plumage, similar in character and position to those just described and probably used in much the same manner for purposes of display, are worn by fully mature males of the South American Bittern, *Botaurus pinnatus*. Two specimens of this species in the Museum of Comparative

Zoölogy have them pure white and better developed than in any example of *B. lentiginosus* that I have ever seen. They are less conspicuous and decidedly yellowish in a third bird belonging to the National Museum. I have failed to find obvious traces of them in the European Bittern (*B. stellaris*) but that may be merely because I have thus far seen no male of this species which was certainly adult and in full nuptial plumage. An allied species, the *Botaurus pœciloptilus* of Australia, New Caledonia and New Zealand, has hidden tufts of plumes situated like those of the American birds but made up more largely of true and fully developed feathers (there are downy ones also), yellowish brown in color with conspicuous darker markings. Whether or not these feathers are ever shown in the form of ruffs must remain doubtful until some one has settled the point by watching the living bird. I have found them only in what appear to be adult males, of which I have seen four or five.

When, in November last, extracts from the present paper were read by me at the meeting of the American Ornithologists' Union in Washington I was not aware that the possession, by the male Bittern, of white plumes ordinarily concealed but sometimes conspicuously shown in the form of ruffs had ever attracted the attention of any one prior to the time (April, 1910) when my observations were made at Concord. At the close of this meeting, however, Mr. Francis Harper (who attended it) informed me that he had seen a Bittern showing white some five years previous to the date of our conversation. He has since written me that he is "very sorry to find" that he has preserved only "exceedingly fragmentary" notes relating to his experience. It happened he states "in the Ithaca marshes," New York, "on May 11, 1905," when he "observed a most strange-looking Bittern with what appeared to be two white shoulder patches joined by a narrow strip over the back. The bird was skulking about in a clump of low cattails at a distance of about a hundred yards." Its white patches "appeared roughly circular and about four or five inches in diameter." They were not seen to "change in size" nor was it noticed "that they projected from the bird's body." Mr. Harper "was inclined then to consider this as merely a case of partial albinism."

I am still further indebted to Mr. Harper for calling my attention to an article on the Bittern by Agnes M. Learned which appeared in 'Bird-Lore' for May–June, 1908 (Vol. X, No. 3, pp. 106–108) and which contains the following interesting paragraph:—

"We were surprised and delighted, and went at once to our bird books to see what the beautiful white feathers were called; but, alas, not a book mentioned them! and later research at the library failed to reveal any information. Only one spoke of them and said that Bitterns did *not* wear nuptial plumes. After much thought, we decided that the Bittern must be like its relatives, the Egrets, and wear nuptial plumes. We thought that the white feathers, or plumes, grew from the region of the scapulars; there were several on each side, and they were not over five inches long and not less than three, and were soft and downy, and with the aid of a glass we could see them flutter in the light wind."

The passage just quoted is obviously and rather curiously incomplete for it stands apart by itself with nothing of kindred character preceding or following it. Perhaps there were originally additional sentences, leading up to and explaining it, which were inadvertently left out at the last moment, either by the author or by the printer. If so their omission was unfortunate for it mars the interest and value of what appears to have been the first published description of the white nuptial plumes of the American Bittern and of the manner in which they are displayed.

TWENTY-EIGHTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Twenty-eighth Stated Meeting of the American Ornithologists' Union convened in Washington, D. C., Monday evening, November 14, 1910. The business meeting was held at 'The Cochran,' 14th and K Sts., N. W., and the public sessions in the auditorium of the new building of the U. S. National Museum, beginning Tuesday, November 15, and continuing three days.

BUSINESS SESSION.— The meeting was called to order by the President, Mr. Edward W. Nelson. Twenty-one Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 897, constituted as follows: Fellows, 49; Honorary Fellows, 12; Corresponding Fellows, 62; Members, 76; Associates, 698.

During the year the Union lost seventy-three members, six by death, twenty-two by resignation, and forty-five for non-payment of dues. The deceased members include two Honorary Fellows, and four Associates, as follows:

Henry Hillyer Giglioli,[1] of Florence, Italy, who died December 16, 1909, in the 64th year of his age, and Richard Bowdler Sharpe,[2] of London, England, who died December 25, 1909, at the age of 62 years, Honorary Fellows; also the following Associates: John Farwell Ferry,[3] who died in Chicago, Ill., February 11, 1910, at the age of 32 years; Alexander O'Driscoll Taylor,[4] who died in Newport, R. I., April 10, 1910, in the 79th year of his age; Daniel C. McEwen, of Brooklyn, N. Y., who died November 1, 1909, and Julian Montgomery Dodge, of Wenham, Mass., who died November 23, 1909.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were re-elected, as follows: Edward W. Nelson, President; Frank M. Chapman and A. K. Fisher, Vice-Presi-

[1] For an obituary notice, see Auk, XXVII, pp. 124–129.
[2] For an obituary notice, see Auk, XXVII, pp. 484, 485.
[3] For an obituary notice, see Auk, XXVII, pp. 240, 241.
[4] For an obituary notice, see Auk, XXVII, p. 363.

dents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, Henry W. Henshaw, Frederic A. Lucas, Chas. W. Richmond, Thomas S. Roberts, and Witmer Stone, members of the Council.

John Hooper Bowles, Santa Barbara, Cal.; E. S. Cameron, Fallon, Montana; Ned Hollister, Washington, D. C.; Waldo Lee McAtee, Washington, D. C.; and Edward Royal Warren, of Colorado Springs, Colo., were elected to the class of Members, and the following eighty-eight persons were elected Associates, namely:

Mrs. Inez B. Adams, Battle Creek, Mich.
Dr. W. W. Arnold, Colorado Springs, Colo.
Prof. G. A. Bailey, Geneseo, N. Y.
Oscar E. Baynard, Gainesville, Fla.
Albert F. Bigelow, Boston, Mass.
Merrill W. Blain, Tropico, Calif.
Edmund Bridge, West Medford, Mass.
Sidney F. Blake, Stoughton, Mass.
Robert L. Bruen, Minneapolis, Minn.
Miss Alice Bryant, Cohasset, Mass.
Eugene E. Caduc, Boston, Mass.
James Samuel Camp, Sentinel, Oklahoma.
Edward H. Christie, St. Louis, Mo.
Miss Alice F. Corey, Plainfield, N. J.
Miss Esther A. Craigmile, Hinsdale, Ill.
Miss Alice Cushman, Philadelphia, Pa.
Miss Edna H. Danielson, Goodhue, Minn.
R. J. H. De Loach, Athens, Ga.
Miss Mabel Densmore, Red Wing, Minn.
Mrs. George P. Derickson, Minneapolis, Minn.
Arthur Louis Dunham, Irvington-on-Hudson, N. Y.
Miss Eleanor P. Earle, Palma Sola, Fla.
Miss Nevada Evans, Minneapolis, Minn.
L. H. Fay, Brocton, N. Y.
Dr. George W. Field, Sharon, Mass.
W. R. Felton, Miles City, Mont.
William W. Grant, Englewood, N. J.
E. W. Graves, Long Island, Ala.
Mrs. Silas Greenwood, Winchendon, Mass.
W. L. Hahn, Washington, D. C.
Frank H. Hall, Geneva, N. Y.
Mrs. George V. H. Harper, Wilmington, Dela.
Mrs. D. H. Harrington, Orange, Mass.

Harold May Holland, Chicago, Ill.
Dr. W. F. Hutchinson, Portsmouth, Va.
Hartley H. T. Jackson,Washington, D. C.
J. M. Jessup, Washington, D. C.
Lindsey Louise Jewel, Gatun, Canal Zone, Panama.
Erwin William Johns, Tempe, Arizona.
Rev. W. R. Johnson, Killarney, Manitoba.
Mrs. Edwin R. Jump, West Newton, Mass.
Edwin R. Kalmbach, Washington, D. C.
Stanton D. Kirkham, Canandaigua, N. Y.
Joseph Kittredge, Jr., Brookline, Mass.
Louis Slidell Kohler, Bloomfield, N. J.
John Dryden Kuser, Bernardsville, N. J.
Susie Dryden Kuser, Bernardsville, N. J.
Frederick Charles Lincoln, Denver, Colo.
Clarence Harvel Luther, D. D. S., Fayetteville, Ark.
George C. Maule, Gum Tree, Chester Co., Pa.
William G. Moore, Haddonfield, N. J.
Thomas Edgar Musselman, Quincy, Ill.
Pingree I. Osburn, Pasadena, Calif.
Jesse E. Packer, Darby, Penna.
Miss Jennie M. Patten, Yuma, Colo.
Fred Albert Pennington, Chicago, Ill.
Mrs. Marian von R. Phelps, Englewood, N. J.
Gifford Pinchot, Washington, D. C.
Mrs. C. E. Raymond, Hinsdale, Ill.
James Henry Rice, Jr., Summerville, S. C.
Miss Almeda B. Robbins, Ware, Mass.
Lewis W. Robinson, Cresskill, N. J.
Dr. Fred Russell, Winchendon, Mass.
Henry E. Ryberg, New Richmond, Wisc.
Clarence Sackett, Rye, N. Y.
Edmund Joseph Sawyer, Black River, N. Y.
Waldo Schmitt, Washington, D. C.
Clarence R. Shoemaker, Washington, D. C.
George Finlay Simmons, Houston, Texas.
Miss Ethel M. Smith, Stevens, Point, Wisc.
Judge Frank Spatter, Winchendon, Mass.
Mrs. Wm. E. Strater, Louisville, Ky.
Katharine H. Stuart, Alexandria, Va.
S. Warren Sturgis, Groton, Mass.
Mrs. Graham Sumner, Englewood, N. J.
D. W. Sweet, Phillips, Maine.
Edmund H. Sweet, Sturgis, So. Dak.
Miss Grace Ellis Taft, New York, N. Y.
J. H. Taylor, Columbia, S. C.

George D. Tilley, Darien, Conn.
Miss Mary I. Tufts, Lynn, Mass.
Curtis Howe Walker, Chicago, Ill.
Ernest Pillsbury Walker, Paradox, Montrose, Co., Colo.
Edward Pearson Warner, Concord, Mass.
Oscar T. Willard, Jr., Chicago, Ill.
Miss Helen D. Wise, Washington, D. C.
Mrs. George Wood, Philadelphia, Pa.
Miss Harriet Wyman, Winchendon, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Drs. A. K. Fisher, Edgar A. Mearns, and Messrs. Frank M. Chapman and Ruthven Deane were re-appointed 'Committee on Bird Protection.'

The amendments to the By-Laws proposed at the last Stated Meeting of the Union were adopted. A new Class, known as Retired Fellows, was thus created, to consist of persons who, by their own desire and by vote of the Council, may be transferred to this Class from the Class of Fellows. They are not entitled to vote nor to hold office, but receive "The Auk" gratis.

PUBLIC SESSIONS. *First Day.*— The meeting was called to order by Vice-President Chapman. An address of welcome was made by Dr. Charles D. Walcott, Secretary of the Smithsonian Institution, on behalf of the United States National Museum.

The papers read during the morning session were as follows:

'Courtship of the American Golden-eye, or Whistler,' by William Brewster.

'Bird Strays in a Great City (New York),' by John Treadwell Nichols. Remarks followed by the Chair and Mr. Osgood.

'Nest Life of the Screech Owl,' by Miss Althea R. Sherman. Remarks followed by Mr. Coale.

Mr. Louis Agassiz Fuertes explained certain habits of Franklin's Gull as observed by him at Heron Lake, Minn.

An out-of-doors demonstration on 'Concealing Coloration' was given by Mr. Abbott H. Thayer.

The papers of the afternoon, all illustrated by lantern slides, were:

'Two Hawk Families,' by B. S. Bowdish. In the absence of the author it was read by Prof. T. G. Pearson.

'Some Rare and Interesting Birds of the Sunken Lands in Arkansas and Missouri,' by Arthur H. Howell.

'Some Experiences and Impressions of the Cowbird,' by Wilbur F. Smith.

'Some Ornithological Results of Biological Survey Field Work in 1910,' by Vernon Bailey.

'A Junco Experience,' by Wilbur F. Smith.

'Isocronal Lines of Bird Migration,' by Prof. Wells W. Cooke.

'Bird-Life on Mt. Orizaba, Mexico,' by Frank M. Chapman.

In the evening the members of the Union and their friends met at dinner at the 'Riggs House.' After the dinner an informal reception was held in the parlors of the same hotel.

Second Day.— The meeting was called to order by Vice-President Fisher. The papers of the morning session were:

'Device for the Convenient Examination of Arboreal Birds' Nests,' by William Brewster. Remarks followed by the Chair.

'Notes on the Great Auk, the Passenger Pigeon, and Eskimo Curlew,' by Edward Howe Forbush. Remarks followed by Messrs. Oldys, Bent, Brewster, and Todd, Dr. Gill and Prof. Hodge.

'The Passenger Pigeon Investigation for 1910,' by Prof. Clifton F. Hodge. Remarks followed by Messrs. Forbush, Goldman and Deane, Dr. Bartsch, and the author.

Mr. Abbott H. Thayer gave a demonstration of the concealment of color markings by definite color areas.

During the recess hour a photograph of the members of the Union was taken on the steps of the Museum building.

The following papers were presented at the afternoon session, all illustrated by lantern slides:

'Photographing Wild Birds by the Lumière Direct Color Process,' by Frank Overton, M. D. It was read, in the absence of the author, by Francis Harper.

'Flashlight and other Bird Photographs,' by Hon. George Shiras, 3d.

'Bird-Life on the Tamiahua Lagoon, Vera Cruz,' by Frank M. Chapman.

'Studies of Winter Wildfowl in Lower Louisiana,' by Rev. Herbert K. Job.

Mr. Wilfred H. Osgood showed photographs on the screen of

several of the Bird Groups in the Field Museum of Natural History, Chicago.

In the evening an informal reception was given the members of the Union, and their wives, by Dr. and Mrs. C. Hart Merriam, at their home, 1919 Sixteenth St., N. W.

Third Day.— The meeting was called to order by Vice-President Chapman.

The papers of the session were:

'Overcoming Fear in Birds,' by Dr. Ned Dearborn. Illustrated by lantern slides. Remarks followed by Prof. Hodge.

'Antiphony in Bird Songs,' by Henry Oldys.

'On some Overlooked Nuptial Plumes of Certain American and Old World Bitterns,' by William Brewster. Remarks followed by the Chair and Mr. Fuertes.

The American Passenger Pigeon. Translated from the Original of Peter Kalm,' by L. M. Gronberger.

The following papers, in the absence of their authors, were read by title:

'The Color of the Gular Sac of the Water Turkey (*Anhinga anhinga*),' by Arthur T. Wayne.

'Mimesis and Rhythm in Bird Songs,' by Rev. P. B. Peabody.

'Collation of Brisson's Genera of Birds with those of Linnæus,' by Dr. J. A. Allen.

'The Extermination of the Wild Turkey in the State of Virginia,' by Dr. R. W. Shufeldt.

'List of Birds Observed in Estes Park, Colo., from June 10 to July 18, 1910,' by Otto Widmann.

Resolutions were adopted thanking the Board of Regents of the Smithsonian Institution for the use of the auditorium in the new building of the United States National Museum for a place of meeting, and for other courtesies extended; to the Local Committee and other Washington members of the Union for the cordial welcome and generous hospitality shown visiting members; and to Dr. Frank Baker, Director of the National Zoölogical Park, for his polite invitation to the members of the Union to visit the Zoölogical Park.

A resolution was passed by the Union regretting the absence from the public sessions of President Nelson, at the present time confined to his home by temporary illness.

On Friday, November 18, after adjournment of the Union, many members visited the National Zoölogical Park by invitation of Dr. Frank Baker, the Director.

The next meeting of the Union will be held in Philadelphia, the date to be determined later.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

Colymbus holbœlli in Kansas.— October 22, 1910, I captured a female Holbœll's Grebe on the Kansas River near Lawrence. The specimen, a female in winter plumage, is now in the collection of Kansas University.— LOGAN EVANS, *Lawrence, Kan.*

A Third South Carolina Record for the Man-o'-war-bird (*Fregata aquila*).— About 8 A. M. on October 19, 1910, I observed one of these birds slowly flying over my yard. At this time the wind was blowing from the northeast at the rate of forty or fifty miles an hour, accompanied with torrential rain. The bird remained in sight for fully eight minutes and finally disappeared in the direction of Sullivan's Island. It seemed to be not in the least inconvenienced by the storm that was raging, and sailed majestically in front of the severe wind with marvellous ease and upon almost motionless wings.

On October 20, 1906, between seven and eight A. M., a specimen was taken during a storm on Sullivan's Island. (See 'Birds of South Carolina,' 1910, p. 13.)

The occurrence of the Man-o'-war-bird on this coast is due entirely to cyclones or very severe storms.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Color of the Gular Sac of the Water-Turkey (*Anhinga anhinga*). —Of the numerous specimens that I have examined in nuptial plumage taken by me during the past twenty-five years the males invariably had this member deep, lustrous black, while in the females, also in nuptial plumage, it was of a lighter shade faintly mottled with yellowish.

Audubon[1] says: "Adult male....gular sac bright orange. Adult female....gular sac as in the male." Dr. Coues[2] says: "Sac orange"— evidently based on Audubon's statement.

[1] Birds of America, VI, 1843, 452, 454.
[2] Key to North American Birds, 1892, 730.

The brain of this species is always infested with numerous cranial parasites (*Filaria anhingæ*), which are coiled up in the cerebellum. An adult male taken May 18, 1910, had ten of these parasites coiled up in the brain, while the gizzard contained great numbers of parasites. That these parasites infest the brain, as well as the gizzard, of the Water-Turkey, was pointed out by Dr. Jeffries Wyman [1] in a lengthy article as long ago as 1868. It would be exceedingly interesting to ascertain by what means these parasites are taken into the body and through what channels they make their way into the brain.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Nest of the Florida Gallinule.— In 1890 and 1891 the Florida Gallinule (*Gallinula galeata*) nested in the marsh at Branchport, N. Y., in large numbers; then several years of dry weather followed, the water receded, the ground was cultivated and the flags and reeds were replaced by crops of corn and cabbage, and in place of the Gallinules and Rails nesting in the reeds we had Spotted Sandpipers and Kildeers nesting among the corn rows.

High water came again in the spring of 1901 and the flats have been flooded each spring since until the marsh has gradually come back to her own with cat-tails, rushes, swamp grass and water lilies, and Soras, Virginia Rails and Least Bitterns are becoming more common each year.

I am quite sure that a Florida Gallinule nested here in 1909 as I saw one several times in June and a juvenile was shot here in September. Several times in May, 1910, when sweeping the marsh with my binoculars I saw a gallinule swimming about in an open space in the flags and in early June I flushed one from the thick flags but after a thorough search could not find the nest.

June 13, C. F. Stone, E. P. St. John and myself were searching the marsh for nests of rail and bittern and Mr. St. John found the gallinule's nest close by the place where I had flushed the gallinule. It was well hidden in a thick growth of sweet flag (*Acorus calumus*) and bulrushes (*Scirpus lacustris*) and was composed of dead flags woven around and supported by the last year's growth of flags. It contained ten eggs which appeared to be well along in incubation. The female must have just left the nest as the eggs were warm but we neither saw nor heard her while we were there. I got a good picture showing the nest and eggs at this time. I visited the nest many times after this but could not get a glimpse of the female.

June 26, there were but five eggs left in the nest, one with the chick exposed and struggling to free itself, but there were no other young ones visible.

Leaving the nest for about half an hour, I visited a nest of the American Bittern and exposed several plates on the five young bitterns. Returning to the gallinule's nest, I approached very carefully and found a downy young one sitting on the reeds where they had been broken down by my many visits. It sat there watching me, its eyes twinkling, starting up ner-

[1] Proc. Bost. Soc. Nat. Hist., XII, 1868, 100–104.

vously now and then, and at my first move it slid into the water and disappeared so suddenly that I was almost sure that it had dived, and I did not see it again. The chick I had left partly in the shell about one-half hour before was now free and struggling to rise. After placing my camera and when nearly ready to make the exposure another chick appeared at the edge of the nest, peeped faintly and was answered by the chick in the nest. Then it climbed up the side and into the nest, climbing over the newly hatched one and I got the picture showing the older one with its wing (showing both digits) resting on an egg and the younger one not yet dry.

I took the older one home with me and it seemed content to nestle in my hand or in a basket. One-half hour later I put it back into the nest and the younger one was not yet dry. They were both quite lively but did not attempt to leave the nest.

The young are born with their eyes open. The body is covered with a thick down, jet black and sooty black beneath; the head and wings are nearly naked; base of bill bright carmine; end of bill orange yellow; a tuft of down under the chin white, with a sprinkling of fine black, giving it a silvery appearance. The eyes show purplish through the skin. The outer digit of the wing is armed with a hooked spur or claw about one-eighth of an inch long, and I noticed a young one use the wing to pull itself up the side of the nest. The feet and legs are dull black.

June 28, there were but two eggs left in the nest and both were pipped. I caught a youngster just as it was getting away through the flags and it was the only one that I could find. I put it up on some bent over flags and got a good picture showing it nearly three-fourths life size with the bare wing and claw and the white beard prominent. It is almost impossible to catch a glimpse of a young one in the nest after they get dry as they leave immediately if they hear one coming, but after I had caught and put them back into the nest they remained still and I had no trouble to focus my camera and make exposures.

I heard the female about several times when I was at the nest but she did not show herself. I visited the nest several times after this date but saw no more of the family.— VERDI BURTCH, *Branchport, N. Y.*

Wilson's Phalarope, A New Species for South Carolina.— On the 7th of September, 1910, while shooting on the eastern end of Sullivan's Island, near Charleston, South Carolina, I killed a Wilson's Phalarope (*Steganopus tricolor*). The bird is a male in winter plumage. It had alighted with about fifteen Yellow-legs on the edge of a freshwater pool left by recent rains. The pool is among sand dunes a few hundred yards from the nearest house and near the car lines. Sullivan's is one of the sea islands and is thickly settled except where the bird was found. The specimen has been deposited in the Charleston Museum (Spec. No. 7249). This is the first record for the species in South Carolina, and, so far as I know, for the Atlantic coast south of New Jersey.— BURNHAM CHAMBERLAIN, *Charleston, S. C.*

Baird's Sandpiper in Massachusetts.— While at Chatham, Mass., I obtained a specimen of Baird's Sandpiper (*Pisobia bairdi*) which was shot October 18, 1910, on Monomoy Point. The identification was verified by Mr. C. J. Maynard, of West Newton, who now has the skin.— MRS. E. R. JUMP, *West Newton, Mass.*

Eskimo Curlew.— It is rather with a sense of reluctance that I send the following record, knowing the suspicion which is bound to arise but, being an enthusiastic gunner myself, I think it may prove of some interest to that very small body of ornithologists who know anything about shore birds. The record is that of the much discussed Eskimo Curlew. It is only within the last year that I realized that this species was nearing extinction. Such a blunder, however, I consider excusable when I take up any recent text-book or list and find this species still mentioned as our most abundant curlew. I understand, however, that the last record of this species from Long Island was in 1884, or 26 years ago. It seems incredible that for 20 years the absence of this species should have passed without remark, unless it be explained, as the present record must be, on the grounds that every gunner supposed these birds were common enough but that he had never happened to see one.

In 'The Auk,' Vol. XXI, p. 79, I recorded a flight of Hudsonian Godwit on the 31st day of August, 1903. That was the morning after a heavy three days' storm, and on that day a friend of mine, an experienced gunner, shot an Eskimo Curlew at Quogue, L. I. I paid small attention to it at the time, believing it to be a fairly common bird. There can be little doubt that this record is correct. I understand that the record in 'The Auk,' Vol. XXI, p. 289, of a bird of this species shot on Sept. 14, 1902 is incorrect. However, it is a strange coincidence that Dr. Braislin, on the same page, refers to one shot from a flock of about 15 as they were passing along the beach, near Zach's Inlet on August 29, 1903. The storm continued on August 30, clearing on the 31st, when the flight above noted took place at Quogue, the birds coming from the west. Zach's Inlet is about 40–50 miles west of Quogue, so that it would seem that Dr. Braislin's record and mine would fit in rather well together. There seems to me no doubt that this bird was a specimen of the Eskimo Curlew.— FREDERICK WM. KOBBE, *New York City.*

Kalm's Articles on the Passenger Pigeon.—In 'The Auk' for October, 1910, Dr. A. H. Wright published 'Some early records of the Passenger Pigeon' (pp. 428–443) and has referred to Kalm's Travels [1] wherein Kalm promises to "speak of them more particularly in another place" but Dr. Wright was unable to find "another place." The elusive articles by Kalm are practically unknown and Coues failed to find one of them but recorded, in the 'Bulletin' of the United States Geological and Geographical

[1] The original of Kalm's Travels was published in Swedish in 1753–'61.

Survey of the Territories (V, p. 794), the Swedish original. The titles of the two are as follows:—

1. Beskrifning på de vilda Dufvor, Som somliga år i så otrolig stor myckenhet komma til de Södra Engelska nybyggen i Norra America. Af Pehr Kalm. < K. Vetensk. Acad. Handlingar, 1759, XX, pp. 275–295, 1759.

This is the original.

2. Beschreibung der wilden Tauben, die manche Jahre in unglaublicher Menge, in die neuen südlichen englischen Pflanzoerter des nordlichen Amerika kommen, von Peter Kalm. < K. Schwed. Akad. Wissensch. Abhandl., 1759, XXI, p. 268–285, 1762.

A translation of the preceding.

Kalm records his observations under the name "*Columba (macroura)*" and cites as synonyms "*Columba macroura*," Edwards, and "*Palumbus migratorius*," Catesby, thus confounding the Passenger Pigeon with the *Zenaidura macroura*.[1] Full descriptions of the male and female are given in Latin (pp. 275–279) and then the Swedish text follows, giving many details of the birds' habits and abundance.

As both articles by Kalm are inaccessible to most ornithologists, a translation would be desirable, even at this late day, and Mr. S. M. Gronberger, an assistant of the Smithsonian Institution, to whom I showed the Swedish article, is willing to turn it into English for the readers of 'The Auk,' if so desired.— THEODORE GILL, *Washington, D. C.*

[As shown by this communication, the readers of 'The Auk' are indebted to Dr. Gill as well as to Mr. Gronberger for the translation of Peter Kalm's paper on the Passenger Pigeon published *antea*, pp. 53–66. — EDD.]

Thoreau's Notes on the Passenger Pigeon.— In connection with Mr. A. H. Wright's compilation of 'Some Early Records of the Passenger Pigeon,' printed in 'The Auk' for October, 1910, Thoreau's records of this species as they appear in his 'Notes on New England Birds' (Boston, 1910) may be of interest, though covering a more recent period. These consist of thirty-eight entries in his Journal, occupying ten pages of the book and extending from 1845 through 1860. They probably give a pretty good notion of the abundance of the bird in the neighborhood of Concord, Mass., during that period. Apparently the Pigeons did not breed there very extensively at that time, though under date of Nov. 8, 1859, it is stated that "Coombs [one of the Concord pigeon-catchers] says that quite a little flock of pigeons bred here last summer." They were found from March through September, but most abundantly by far in the latter month. There were several stands in the neighborhood, and catching began about the middle of August. The notes contain nothing to indicate any marked diminution in their numbers between 1845 and 1860, and the last entry — on Sept. 4 of the latter year — records 'flocks of pigeons' seen on the 2d and 3d.— FRANCIS H. ALLEN, *West Roxbury, Mass.*

[1] *C. migratorius* was not recognized as a distinct species by Linnæus till 1766.

Black Vulture in Stuben County, N. Y.— A Correction.— In 'The Auk,' Volume XXVII, page 208, will be found a note by me on the taking of a Turkey Vulture in northern Steuben Co., N. Y., on July 11, 1909. Mr. Cowan, in whose possession the specimen was, told me about it and I had faith in his judgment as he had Chapman's 'Handbook' and I had cautioned him to be sure of the identification. I have since had the pleasure of examining the specimen and find it to be without a doubt a Black Vulture (*Catharista urubu*). I regret that the error was made and my note written but am glad to be able to make the correction and record the specimen, as it seems to be the first record of the Black Vulture for Steuben County and the fourth for western New York.— VERDI BURTCH, *Branchport, N. Y.*

Black Vulture in Virginia.— In looking over some back numbers of 'The Auk,' I came across Mr. John W. Daniels, Jr.'s 'Notes on the Black Vulture (*Catharista uruba*) in Virginia' (Vol. XIX, p. 397), extending the range of this bird northward to Norfolk and Princess Anne Counties. Within the last four or five years these birds have been regular summer visitors to York, Elizabeth City and Warwick Counties, on the north side of James River, a few pairs breeding in the last named county.— H. H. BAILEY, *Newport News, Va.*

A Fourth South Carolina Record for the Saw-Whet Owl (*Cryptoglaux acadica*).— I am indebted to my friend, Mr. James P. Garick, Jr., of Weston, Richland County, for the gift of an adult female of this species, which was captured alive by him in his yard on November 11, 1909. Mr. Garick writes me that it was taken from a hollow of a tree about 100 yards from his house. It was first observed by his cook, who reported it to him, and he immediately secured it. The early date on which the bird was taken seems to warrant the belief that this species is a regular although rare winter visitor, and not of mere casual occurrence, its nocturnal habits making it difficult of detection.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Breeding of the Barn Owl.— Mr. Arthur T. Wayne has published an account [1] of the finding of a set of eggs of the Barn Owl (*Aluco pratincola*) on this coast during the month of September. He also refers to Audubon's discovery of a nest containing young birds which he (Audubon) concluded were hatched in September. Mr. T. Gilbert Pearson [2] records this bird as breeding on the coast of South Carolina in April. In view of this a recent record (confirmatory of Mr. Wayne's account) may be of interest.

On September 24, 1910, after rowing across the Ashley River from Charleston, I landed at the Wappoo Fertilizer Mills, an abandoned and much

[1] Auk, XXV, 1908, pp. 21–24.
[2] Auk, XXV, 1908, pp. 316, 317.

dilapidated group of buildings. In the top of one of these buildings I found a set of four eggs placed in a large box which was supported by huge beams. As I approached the box an old Barn Owl jumped out and flew through a broken window. On examining the interior of the box I found that its contents were mostly old bones and feathers, while around the box and below some of the rafters I saw only disgorged hair and bones, indicating that the old owls tear the flesh from the bones to feed their young, while they themselves swallow bones, feathers, and all. The building has probably been abandoned for about fifteen years and I suppose that the owls have been breeding in it ever since. This would account for the great accumulation of bones and feathers. I also found in this box parts of the Meadowlark (*Sturnella magna*), the Green Heron (*Butorides virescens*), and the Marsh Hen (*Rallus crepitans* or *R. c. waynei*). Below the box I saw the skin of a black rat, and found the skull of a sparrow. Of the eggs taken, two were fresh, the third nearly so, while the fourth contained a small embryo.— RHETT CHAMBERLAIN, *Charlestown, S. C.*

White Pelican in South Carolina.— On October 26, 1910, a White Pelican (*Pelecanus erythrorhynchos*) was shot in the Santee swamp by a farmer, from whom it was obtained by Mr. William C. Smith of Charleston, in whose possession it now is. The bird measures approximately sixty-four inches in length as mounted, and the bill thirteen inches. The primaries are black, and the bill, pouch, and feet are yellow. These characters prove conclusively that the bird is not an albino Brown Pelican (*P. occidentalis*), and a record is thus established for a species which has apparently not been taken in South Carolina for nearly a hundred years. Mr. Wayne states [1] that he has never seen the White Pelican on our coast, and quotes Bachman's account as given by Audubon. Dr. Bachman procured two specimens on July 1, 1814, from a flock which he believed had laid eggs on the banks off Bull's Island.

The specimen in Mr. Smith's possession was apparently blown here by a West Indian hurricane which passed up the coast immediately before it was taken.— PAUL M. REA, *The Charleston Museum, Charleston, S. C.*

The Evening Grosbeak at Boston, Mass.— On December 5, 1910, two Evening Grosbeaks (*Hesperiphona vespertina vespertina*) were seen in Olmsted Park beside Leverett Pond in a birch tree. It was at this precise point in the park that the Orange-crowned Warbler and the Blue-grey Gnatcatcher had been seen two days previous, of which another general note furnishes the record. Neither bird was in the plumage of the adult male. One showed but a bit of yellowish color on the nape of the neck. The other was somewhat more yellowish. Both birds had a black tail tipped with white and the black upper tail-coverts also tipped

[1] Birds of South Carolina. Contr. Charleston Mus., I, 1910, p. 12.

with white. The bills of both were horn-color. The more yellowish bird, quite probably a young male, gave many clear whistles as he moved about in the birch, or dropped to the ground. The other bird, in the plumage of the female, responded with a slight chattering. The birds were viewed as near as fifteen feet. Both at length flew across the pond, where the young male's whistles could still be heard. These birds were thus in Brookline as well as Boston and crossed the waters on which the rare wild ducks wintered last season (Auk, October, 1910, pp. 390–408). Two other records of a single bird each, seen by other observers, have come to my knowledge, indicating that once more this far northwestern bird has appeared in eastern Massachusetts.— HORACE W. WRIGHT, *Boston, Mass.*

Lapland Longspur and other Birds in Delaware.— December 3, 1910, while tramping a tidal marsh near Delaware City, Del., in company with Dr. Spencer Trotter of Philadelphia, Pa., we flushed three birds we thought at long range to be Titlarks (*Anthus pensilvanicus*). On following them up Dr. Trotter shot one and our surprise was great to find it a fine male Lapland Longspur (*Calcarius lapponicus*), a very rare bird for this section and a first record for Delaware. While the other two birds were seen later they could not be positively identified as of this species.

In 'Cassinia' for 1906, page 63, a total of seven individuals of this species from the Delaware Valley are reported by Mr. R. F. Miller, covering from the first one noted by John Cassin, found in a Philadelphia city market in January, 1849; one on League Island, Philadelphia, about 1864; four shot in New Jersey in 1895 (two of these near Princeton, possibly not strictly Delaware Valley); the other seen at Harrowgate, Philadelphia, November 22, 1904.

Among other birds there were observed at the above noted time and place, several Titlarks (*A. pensilvanicus*), a flock of twenty Horned Larks (*Otocoris alpestris alpestris*), two shot; two Great Blue Herons (*Ardea herodias*); six Wilson's Snipe (*Gallinago delicata*), and several Savannah Sparrows (*Passerculus sandwichensis savanna*).— C. J. PENNOCK, *Kennett Square, Chester Co., Pa.*

The Lark Sparrow in Massachusetts— On September 25, 1910, a fine Lark Sparrow (*Chondestes grammacus*) was observed at Berlin, Mass. While walking on the Clinton Aqueduct in that vicinity a sparrow flew up from the ground and rested on a low fence beneath us in fine light and situation. This bird remained in a favorable position for several minutes, so that all distinguishing features, even its swollen grayish bill, were easily observed by our party of four. A friend living in this vicinity, who is a bird-lover and good observer, records an individual of this species seen in this locality in the spring. I have noticed this year and last that migrating sparrows are found here in very large numbers and in our walks discovered twenty-six species of land birds in a district of short radius.— J. E. KLOSEMAN, *Dedham, Mass.*

A Note on the Prothonotary Warbler.— In the many biographical sketches of the Prothonotary Warbler, one finds considerable unanimity concerning the succession of mating and nest building and the sex building the nest. For instance, Loucks in his 'Life History of the Prothonotary Warbler,'[1] states: "Soon after mating, the birds begin to build their nest.... In the construction of the nest, the female bird works alone. I have never yet seen a male really aiding in this task." The authors, studying in localities where the bird is more or less abundant during the breeding season, evidently made such notes from series of observations. A single instance contrary to the above is, therefore, probably less important than it is interesting. The case in point is that of a male Prothonotary Warbler which appeared at Ithaca in the spring of 1910. It was first seen May 31 in some willows overhanging a back-water from Fall Creek, one of the main tributaries of Cayuga Lake. It was singing at the time but soon flew down to the water's edge. Here it seized a good sized straw and thence carried it to a hole in a dead stub some five feet above the water. The site was an abandoned Downy Woodpecker's nest, the opening of which had, by some agent or other, been enlarged leaving its borders jagged and rough. While the bird was under observation, it continued flying to and from the hole carrying bits of grass, straw, bark and the like, most of which was obtained at the water's edge. It sang very frequently, often with nesting material in its bill, which was opened so widely during the process that the material was sometimes lost. The nest was not examined closely at this time for fear of disturbing the bird but from the place of observation the nesting material was seen projecting from the hole. Nothing was seen of a female. Two days later the bird had ceased carrying nesting material and was singing in the willows nearby. Upon careful examination the nest was found to be quite complete but there were no eggs nor was there yet any sign of a female. For eleven days this male was seen or heard singing about the spot but no eggs ever appeared in the nest and no female was ever discovered. He was never seen to enter the nest after the third day of observation but, with one exception, was found at all hours within fifty feet of the nesting site, usually singing. On one occasion he was seen to drive away a Bluebird which alighted on the stub. On June 12 he disappeared and did not return.

From these observations it would seem that this male, very shortly after arriving and before finding a mate, selected the nesting site and began building the nest. Furthermore, after completing the nest he waited, apparently for a female, at least nine days before deserting the site which he had chosen. In localities where the species is more abundant and mating is therefore assured, the necessity for the males building the nest may never arise. But the fact that this male, when isolated, was able to select the site and complete the nest in the absence of the female is quite significant.— Arthur A. Allen, *Cornell University, Ithaca, N. Y.*

[1] Loucks, W. E. Bulletin 4, Article 3, Illinois State Laboratory of Natural History.

A Third Autumnal Record of Kirtland's Warbler (*Dendroica kirtlandi*) **for South Carolina.**— Early in the morning of October 4, 1910, I heard on Oakland plantation, Christ Church Parish, a peculiar call-note, intermediate in tone between those of the Prairie Warbler (*Dendroica discolor*) and Palm Warbler (*D. palmarum*). The sound came from among the terminal ends of a very leafy branch of a small live oak tree, but although I was within twenty feet of the sound it was impossible to see the bird. I was satisfied then that it was a Kirtland's Warbler, and convinced when it flew and alighted on a dead branch of another live oak near at hand — but too close to obtain it in perfect condition. The pale yellow under parts and the deliberate wagging of the tail, aside from its large size, made the identification as absolute and conclusive as though it was in my hand. Upon my retreating to secure it in perfect condition the bird flew and lit among hundreds of lavender bushes across a canal. In attempting to enter the place by a circuitous route it flew again and this time out of vision. The pale yellow under parts suggested that it was a female. The bird was entirely alone and, like the one I shot on Octover 29, 1903 (Auk, XXI, 1904, pp. 83, 84), was absolutely fearless.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

A Mockingbird in Rhode Island.— Miss Julia Herreshoff of Bristol, R. I., communicates to me the following in a letter dated November 8, 1910: "The Mockingbird came with the Blackbirds, first noticed March 12 (1910). He was near the house for a fortnight and then deserted his black friends for Robins and lived at the Old House (the Herreshoff homestead next door). I did not see him after July 25 when tenants took possession. He was quite friendly though I think by his early coming there was no chance of his being an escaped cage-bird."— REGINALD HEBER HOWE, JR., *Thoreau Museum, Concord, Mass.*

A Pair of Mockingbirds near Boston in 1902.— Concerning the note in the October 'Auk' of 1910 entitled: "The Mockingbird near Boston," signed by Mr. Francis H. Allen of West Roxbury, I would say, that in 1902 a pair of Mockingbirds (*Mimus polyglottos*) built two nests within sight of my home in Roslindale. The male was constantly under our kitchen windows. He entertained us the entire summer, not only with his singing, but also by his gymnastics while doing so. He would frequently light on the ridge-pole of my neighbor's house, and vertically bounce up and down, five to ten feet, singing all the while. He would do this frequently eight or ten times in succession. I first noticed the male when the apple trees leaved out, but neglected to record the exact date.

Shortly afterward he was joined by a female. They built in a large white oak tree situated midway between Congress and Fletcher Streets on Center Street, Roslindale.

The nest was quite high up. Four young were raised, but were presumably stolen by a laborer who was working on a sewer, then in construc-

tion, on Center Street. When the young were about to leave the nest, one of my sons heard the man in question say, that he was "coming out early to-morrow morning and take those birds." As the nest was empty on the day designated, it is quite probable he succeeded in doing so. The parent birds were inconsolable for a time. Soon, however, they built again; this time low down in a golden elderberry bush which grew, within twenty feet of the house, on the front lawn of one of my neighbors. Here three young were raised and successfully launched from the nest. I saw two of the young birds killed by neighbor's cats. This same fate overtook the mother.

One day while sitting on my piazza, I saw in the vacant lot opposite, a cat spring into a hollow apparently in the act of catching a bird. Hearing the great distress of the male mockingbird directly over the hole, I ran to the place, but alas! too late. The cat bounded away but in her fright dropped the bird. Immediately picking it up, I recognized the still beautiful though lifeless mate of the distracted father who was hovering over me.

The father mockingbird and one of the young were constantly seen about the neighborhood until autumn, when they probably went South. In passing, I may say that it was this particular pair of mockingbirds which first incited me to the study of bird life. Whether the pair of mockingbirds described above are the pair referred to by Mrs. Seriah Stevens or not I do not know, but I have never heard of other than this pair nesting in Roslindale in 1902.— Julia Wingate Sherman, *Roslindale, Mass.*

A Blue-gray Gnatcatcher in Brookline and Boston, Mass.— On December 3, 1910, when passing through Olmsted Park, lying partly in Boston and partly in Brookline, I came upon an Orange-crowned Warbler (*Vermivora celata celata*) in a planting of shrubbery. It was an unusually brightly plumaged bird, others which I had seen in former seasons having been much more dusky and dull-plumaged. This warbler had just gone from view by taking a short flight out of my range of vision, when another very small bird was seen directly before me, which by coloration, form, and movement I perceived at once to be a Blue-gray Gnatcatcher (*Polioptila cærulea*). The tone of color of the upper parts was a very clear blue-gray, and the nervous switching and erecting of the tail were characteristic movements. I had several good views of the bird both in trees, on shrubs, and on the ground before it passed from sight, when automobile travel intervened. It appeared to be gleaning food of larvæ or insect's eggs from the twigs and remaining leaves. The following day five other observers, associate members of the A. O. U., to whom the knowledge had been given, also saw this bird in the same park a little farther southward. The earliest observer found it still in the company of the Orange-crowned Warbler, but the later group, while seeing the Gnatcatcher, was unable to find the warbler. On December 4 the bird was on the Boston side of the park, having been on the Brookline side when seen by me. In 'The Auk'

for January, 1905, p. 87, is a note of my earlier observation of a Blue-gray Gnatcatcher on October 22, 1904, in the Boston Public Garden.— HORACE W. WRIGHT, *Boston, Mass.*

An Albino Robin.— In a flock of about twenty Robins an albino Robin was seen in "30 Acres," Roslindale, Mass., September 22, 1910. Two days later, I saw this bird twice, feeding on Rowan berries which grew on an ornamental tree opposite my home. This time the breast of the Robin was turned towards me. The light being perfect, I felt myself fortunate. The body was pure white with the exception of a few dusky feathers on the back. A perfect "robin-red-breast" red crescent showed on the upper breast similar to the black one of our Northern Flicker. A few red feathers were sprinkled over the lower underparts. The wings were largely dusky, as were the central tail feathers, the outer ones being pure white. He looked much larger than the average Robin both in flight and when perched. This was undoubtedly an illusion due to color.— JULIA WINGATE SHERMAN, *Roslindale, Mass.*

Notes from Boulder Co., Colorado. LEAST BITTERN.— A pair of these birds was seen in a cat-tail marsh near Boulder on May 28, 1910. On June 5 their nest was found containing four eggs. On June 12 one of the birds was observed on the nest which at that date contained five eggs. On June 18 the five eggs were in the nest, though no birds were observed. On July 9 what appeared to be a young bird left the nest; one sterile egg remained. I have found no other record of the nesting of the Least Bittern in Colorado.

CALIFORNIA CUCKOO. A cuckoo, probably of this form, was seen on July 9 and again on August 6, 1910, in the outskirts of Boulder.

DICKCISSEL. A male was seen on July 9 and 24, 1910, near Boulder. The bird was in fine plumage and was singing.

CAÑON WREN. The new Check-List limits the range of this wren in eastern Colorado to "southeastern Colorado." I have found the species a quite common resident in the cañons near Boulder, which is near the middle of the northern half of the State. A nest with young was found on July 10, 1910, well hidden in a crevice in one of the large rocks on a steep slope of one of the cañons.

PRAIRIE MARSH WREN. A female marsh-wren, taken Oct. 8, and a male taken Oct. 22, 1910, on the plains near Boulder, were identified by Mr. Oberholser as *T. p. iliacus*. Prof. Cooke states that these are the first actual records for Colorado for this form. From the Check-List range this would seem to be the form expected east of the range, though Mr. L. J. Hersey (Condor, July–August, 1909) records *T. p. plesius* as common at Barr, which is about thirty miles further east on the plains.— NORMAN DEW. BETTS, *Boulder, Colorado.*

Two Unusual Massachusetts Records.— On October 20, 1910, Mr. T. C. Wilson, of Ipswich, brought me a young male Clapper Rail (*Rallus crepitans crepitans*). It was shot in the salt marshes of that town near the Poor Farm, and was a young bird of this season. This seems to be the second authentic Massachusetts record.

Three Spoonbill Ducks (*Spatula clypeata*) came into Wenham Lake, Massachusetts, on October 15, 1910. I secured all of them. There are only two other records of this duck at Wenham from 1899 until the present date. All three specimens were males.— J. C. Phillips, *Wenham, Mass.*

Old Records for Massachusetts and Rhode Island.— In looking over my note books recently I came across a few entries which seem to me sufficiently interesting to record in 'The Auk,' and which may possibly be of use for future reference.

Nantucket Island, Massachusetts. While out shooting at the western part of the island a number of years ago, I heard a shot close at hand, and on driving up I found Mr. Eschevria (a regular summer resident) standing near the shore of the Reedy Pond. I found he had just killed a Long-billed Curlew (*Numenius longirostris*). I carefully examined the bird, which he offered to give me, but which I declined. In all the years I have been shooting on the island this is the only authentic instance that I am aware of that it has been taken here, and I therefore desire to record it. I regret now that I did not make a note of the date of capture. It was, however, in August or September.

November 5, 1875. Shot one Pintail Duck (*Dafila acuta*).

October 4, 1877. Shot two Red-backed Sandpipers (*Pisobia alpina sakhalina*).

September 23, 1878. Two Passenger Pigeons (*Ectopistes migratorius*), in immature plumage, on the outskirts of Siasconset Village.

August 31, 1889. Shot one Red-headed Woodpecker (*Melanerpes erythrocephalus*), in immature plumage, apparently born on the island. September 23 saw a young bird, on November 23, saw another, and on September 10, 1881, shot one.

October 2, 1880. Saw six Wood Ducks (*Aix sponsa*) in the north head of the Hummuck Pond and shot three of them; they were not in full plumage.

February 22, 1891. Saw five or six Meadowlarks (*Sturnella magna*).

August 25, 1884. Shot one Marbled Godwit (*Limosa fedoa*), the only one I have heard of there.

August 19, 1888. Saw two Willet (*Catoptrophorus semipalmatus*). I have seen several others, but have not the dates.

August 21, 1892. Shot one Hudsonian Godwit (*Limosa hæmastica*); had some red feathers on the breast.

February 21, 1892. We shot a Loon (*Gavia immer*) to-day from the Jetty, which had scarcely any feathers on the wings; the bird could not possibly have flown. I took it to be a case of moult.

Muskeget Island, Massachusetts, March 11, 1894. Six Sanderlings (*Calidris leucophæa*) have lived in the vicinity the past winter.

Somerville, Massachusetts, March 20, 1840, and Revere, Mass., March 6, 1880. On each of these dates Mr. George A. Tapley of Revere, Mass., shot an American Golden Plover (*Charadrius dominicus*). Mr. Tapley informed me he had killed one other in the spring.

Revere, Mass., May, 1889. Mr. George A. Tapley saw six Pectoral Sandpipers (*Pisobia maculata*), in one flock, and shot one of them; May, 1890, he saw two and shot both.

Wellfleet, Cape Cod, Mass., August, 1865. Shot two Marbled Godwits (*Limosa fedoa*).

West Island, Seconnet Point, Rhode Island, May, 1873. In the early part of this month, three Hudsonian Godwits (*Limosa hæmastica*), all there were. They alighted on the end of a gravel spit which was exposed at low tide on the north side of the island near the boat house. I secured all three at the first shot. They were in the gray plumage.

West Island, Seconnet Point, R. I., April 27, 1875. Shot one Red-throated Loon (*Gavia stellata*), April 16, 1878. A good many flying on migration; wind light northeast. Shot one on April 1, 1881; one on April 13, 1884; three on April 14, 1886; one on April 15 and four on April 20, 1887; one April 21, 1887, and April 16, 1892. A migrating movement eastward; birds flying about sixty yards high; noted one flock of five, one of six, the others scattering, about twenty-six birds in all. April 17, 1892, saw eight flying on migration; wind light west.

April 14, 1886. Quite a flight of Loons (*Gavia immer*), on migration; wind east, a gentle breeze.— GEORGE H. MACKAY, *Nantucket, Mass.*

Massachusetts Notes.— On October 24, 1910, I shot a partial albino Sharp-tailed Sparrow (*Passerherbulus caudacutus*) on a salt meadow at Nantucket, Mass. I had seen it several days previous but was unable to secure it then. The upper parts are blotched with several patches of pure white feathers. The coverts of the left wing are also pure white while the feathers on the right wing are only margined with white. The tail, crown and primaries are normal in color as are also the underparts and nearly all the rest of the bird.

Early in November, 1909, two White-fronted Geese (*Anser albifrons gambeli*) were shot at a stand on Sesachacha Pond, Nantucket. I heard of their being killed last spring and was told by the man who had one of them mounted that they were Lesser Snow Geese. However, this bird has recently been presented to the Boston Society of Natural History and has proved to be *Anser albifrons gambeli*. It is a young bird and the white at the base of the bill is only just beginning to appear. Also the tips of the feathers of the underparts show faint traces of black. There are only three other records for New England, and these are all from Massachusetts. A male was shot at Quincy some time about 1848–50

and was presented to the Boston Society of Natural History.[1] At present there is no trace of this bird. Dr. T. M. Brewer, in 'A Defence of his Catalogue of the Birds of New England,'[2] says: "*Anser gambeli*, between 1836–46, was much more common than it apparently is now, but even now there is no lack of evidence of its presence.... A fine specimen in immature plumage has been recently taken in Gloucester and is now in the collection of Mr. William Jeffries of Boston." The bird referred to was shot October 20, 1876, at West Gloucester, and at the time was supposed to be *Anser albifrons gambeli*; it turned out, however, to be a Blue Goose. This also is now in the collection of the Boston Society of Natural History and is the only one ever recorded from this State. Possibly after all *A. a. gambeli* was not as common even between 1836 and 1846 as Dr. Brewer supposed. The second authentic record was one shot at Plymouth, November 26, 1897, by Mr. Paul W. Gifford.[3] It is an adult specimen and is to-day in Mr. William Brewster's collection. Of these few records the third is the most interesting, for it is an adult bird that was caught alive in a wounded condition early in August, 1907, at Great Neck, Ipswich, by Mr. A. B. Clark.[4] This bird is still alive and I believe several unsuccessful attempts have been made to cross it with a wild Canada Goose.

In 'The Auk,' Vol. XXVII, No. 3, page 339, Mr. R. Heber Howe, Jr., mentions a King Rail (*Rallus elegans*) being shot at West Barnstable on Dec. 30, 1909, as the ninth record for the State. I have five more unrecorded specimens making a total of fourteen. The first one was shot on the Neponset meadows, near Canton, on September 9, 1893, and is in the collection of the Boston Society of Natural History. The other four were all shot in 1909, at Chatham, and as far as I can find they are the only ones known to the local gunners ever to have been taken there. Of these four the first was taken January 9, 1909, by Mr. Russell Bearse in a brackish marsh while he was duck shooting by moonlight. This is now owned by Mr. W. E. Freeman of Arlington. The second was shot by Mr. W. A. Carey of Boston on October 2, and is now in his collection. He was shooting quail along the edge of a cranberry bog when the dog flushed this bird. The third was caught alive on October 25 by a setter dog in a bit of salt marsh, and is now in the collection of the Boston Society of Natural History. The fourth was killed by Mr. Frank Eldredge on October 20. This one was shot on Monomoy Island, in a salt meadow where Mr. Eldredge was after shore birds. It seems very remarkable that these last three should have all been taken within the space of about three weeks time and all within an area of a few square miles. Undoubtedly the King Rail is more abundant than is generally supposed, and although it is thought that it may breed within the limits of the State, no authentic case has yet been recorded. However, this recent abundance may lead

[1] Cabot, Proc. Bost. Soc. Nat. Hist., Vol. III, 1851, p. 136.
[2] Bull. Nutt. Ornith. Club, Vol. II, April, 1877, p. 46.
[3] Auk, Vol. XVIII, pp. 135, 136.
[4] Auk, Vol. XXV, 1908, p. 80.

in the near future to some such discovery.— S. Prescott Fay, *Boston, Mass.*

Number of Species and Subspecies in the New A. O. U. Check-List: A Correction.— In 'The Auk' for October, 1910 (XXVII, pp. 468, 469), the number of species in the third edition of the A. O. U. Check-List is given as 802, and the number of subspecies as 394, making a total of 1196 forms. Prof. W. W. Cooke later informed me that he made the numbers to be, respectively, 804, 396, 1200. A recount shows Professor Cooke's numbers to be correct, namely, 804 species, 396 subspecies, and 1200 forms.— J. A. A.

RECENT LITERATURE.

Carriker on the Birds of Costa Rica.[1] — In this work of some 600 pages, our knowledge of Costa Rican birds is brought thoroughly up to date. The author's style is pleasing and his method of treatment is both modern and comprehensive. A total of 753 species and subspecies is recorded, with full citations of Costa Rican references and many hitherto unpublished records, based chiefly on the collections of Ridgway and Zeledon, Carriker, Underwood and Lankester.

The local distribution is well worked out and treated in more detail than in any previous work. Under almost every species are interesting notes on the life history, from the author's own experiences, in many cases with descriptions of nest and eggs. These form an important addition to our knowledge of Neotropical bird-life. Under the Tanagers and Finches Mr. W. E. C. Todd has incorporated in the text many valuable critical notes. Keys are given to the species of most of the lower groups as far as the Cotingidæ, with the evident intention of supplementing those in the first four volumes of Ridgway's 'Birds of North and Middle America.'

The 60 pages of introductory matter treat, among other subjects, of "Geography and Physiography," "The Life Zones" and "History of the Ornithology of Costa Rica." A Bibliography is of course included, and a comprehensive descriptive list of localities at which birds have been collected. Some general notes on the habits of both the winter visitant and the resident species are also to be found here. At the end of the volume is a large folding map of Costa Rica.

[1] An Annotated List of the Birds of Costa Rica including Cocos Island. By M. A. Carriker, Jr. Reprinted from Annals of the Carnegie Museum, Vol. VI, pp. 314–915, with map. "Issued August 29, 1910."

Mr. Carriker's division of Costa Rica into life-zones deserves careful consideration. Three Primary Areas, Boreal, Sonoran and Tropical, are recognized. These are divided into six Regions, and these again into fourteen Zones or belts. Judging by this list it is certainly true, as the author states, after referring to the life zones of North America, that: "In Central America, however, we have a much more complicated state of affairs than in North America," for "some zones or belts of the Tropical occupy exactly the same ground as some of the Sonoran, so that it is only by studying the affinities of the various species and determining whether they are modified Tropical or Sonoran forms, that we are able to account for their presence in certain regions and give a reasonable explanation of the finding of two widely different types in apparently the same zone."

The practicability of such an arrangement is open to doubt, particularly as the determination of the origin of many species is by no means an easy matter and we fear that the author's attempt to draw a line between "Tropical" and "Sonoran" species has not been wholly successful. For example, the correctness of ascribing a northern origin to such species as *Planesticus nigrescens, Myioborus torquatus, Pheucticus tibialis, Amaurospiza concolor, Phainoptila melanoxantha* and several others is surely very doubtful.

A notable feature of the Costa Rica avifauna is the remarkable rarity of many of the resident species. Some of these are not found outside of Costa Rica and the adjoining parts of Panama, and their rarity is believed to be actual, and not merely apparent as in the case of many very local species or those of retiring habits or found in inaccessible places. The author believes that these rare species "belong to a vanishing fauna, and for reasons of high specialization, interbreeding, or inability to hold their own in the ever present struggle for the survival of the fittest, are slowly disappearing." With so large and varied a bird population concentrated in so restricted an area it is natural that many species should be able to exist only in small numbers, and thus be ever in danger of extermination. This fate has doubtless already overtaken several species and may explain the apparent absence of a number of forms that have been found both north and south of Costa Rica, as, for example, *Amaurolimnas, Rhopoterpe, Pyrocephalus, Myrmeciza lawrencei, Gampsonyx, Ictinia, Ceryle inda* and *Rhynchortyx*.

There are several interesting facts in regard to the Costa Rica avifauna and some interesting comparisons that may be made, that have not been brought out by the author and it may be worth the space to go over them here.

As stated above the total number of forms given is 753. From this number the five Cocos Island species may be subtracted as being not truly Costa Rican, leaving 748 species and subspecies. Deducting the latter, of which there are about 33, we have 715 full species remaining.

It is of interest to compare this total with the number of species known from the region covered by the A. O. U. Check-List. From this vast area,

the entire North American continent north of Mexico, including also Greenland, Lower California and numerous islands, the total recorded number of forms is 1200. The proportion of Accidental Visitants (81) and subspecies (385) is far higher than in the case of Costa Rica. Deducting these leaves 734 full species, only a few more than the number known from Costa Rica.

When it is considered that the whole of Costa Rica is not as large as the peninsula of Florida, the wonderful richness and variety of its bird life — undoubtedly one of the most remarkable bird faunas in the world — will be appreciated.

About 120 of these Costa Rica forms are winter visitors or transients (several North American migratory species are represented by two subspecies). Leaving these out of account, and also making allowance for 3 or 4 stragglers over the southern boundary, and an equal number of doubtful species known from only a single specimen, we find a round 600 species constituting the resident avifauna of Costa Rica.

Many genera of the smaller birds are remarkably represented. Thus *Trogon* and *Euphonia* have each nine species, *Tangara* (*Calliste*) has seven species and one subspecies, *Thryophilus*, seven, *Catharus*, *Columba* and *Geotrygon* each have six, *Basileuterus* is represented by five species and two subspecies, *Saltator* by five species and two subspecies, and *Planesticus* by five species and one subspecies.

Many of the "lower" groups on the other hand make a comparatively poor showing; thus there are only four breeding species of Anseres. Many genera represented by breeding forms in both the Nearctic region and South America are here wanting or occur only as migrants. The astonishing number of four families, 50 genera and 205 full species are not known to range beyond the northern boundary of Costa Rica.

A new genus *Dicrorhynchus* is proposed by Mr. Carriker for the curious barbet, *Tetragonops frantzii* Sclater. It is distinguished structurally from its only other near relative, *Semnornis rhamphastinus*, solely by a slight difference in the form of the bill, differing otherwise only in coloration.

The following new species and subspecies are named and described: *Columba flavirostris minima*, *C. nigrirostris brunneicauda*, *Chæmepelia passerina neglecta*, *Selasphorus simoni* (nearest *S. ardens*), *Dendrocincla anabatina saturata*, *Campylorhamphus pusillus borealis* and *Corapipo altera albibarbis*.

This last subspecies, has lately been described by Dr. Hellmayr under the name *Corapipo leucorrhoa heteroleuca*, this name antedating that given by Mr. Carriker.

The three current subspecies *Attila citreopygus luteolus*, *Pachyrhamphus polychropterus similis* and *Pachysilvia ochraceiceps pallidipectus* are discussed and considered as not entitled to recognition.

Several forms usually accorded specific rank, namely *Urubitinga ridgwayi*, *Amazona salvini*, *Ceophlœus scapularis*, *Agyrtria decora*, *Selasphorus torridus*, *Trogon underwoodi*, and *Euphonia gnatho*, are reduced to sub-

species, some of them, in our opinion, without sufficient reason, for though they are undoubtedly closely allied representative forms, no evidence of intergradation is brought forward. The new *Corapipo* also seems to us worthy of specific rank. On the other hand *Saltator intermedius* and *Astragalinus columbianus* are granted binomials.

The list of species and subspecies is so nearly complete that we have noticed the omission of only one form, *Sayornis nigricans nigricans*, for which there are two authentic Costa Rican records.

While *Ceryle inda* and *Tyrannus dominicensis* have apparently never been taken within the limits of this list, both have been found common at Greytown, Nicaragua, just across the line, and there can be no doubt of their occurrence in Costa Rica.

The occurrence of *Stelgidopteryx serripennis serripennis* as a breeding species is noteworthy, but it may be well to again call attention to the fact that the presence of black on the under tail coverts is not necessarily an indication of intergradation with any of the other forms of *Stelgidopteryx*, as this is a variation known to occur throughout the bird's range.

Very few if any typographical errors are discoverable, and the orthography of the scientific names, revised by Mr. Todd, is almost above criticism. There are a few inconsistencies in the gender endings not corrected in the "Errata," but few works are altogether free from these trifling defects.

The system of nomenclature is consistently trinomial, but in some cases where the specific name should be repeated to indicate the typical subspecies it has not been done.

Phainoptila is wrongly placed in the Ampelidæ; *Falco columbarius* is interpolated between *F. albigularis* and *F. aurantius*, which appear in the Key as *F. rufigularis* and *F. deiroleucus;* the Brown Pelican stands as *Pelecanus fuscus* instead of *P. occidentalis*.

The mere mention of these slight errors unduly magnifies their importance. Few of them are of any consequence and they do not detract from the general excellence of the work.

The absence of an index is an omission for which the author is probably not responsible. Doubtless there is one supplied with the complete volume of the 'Annals' from which this paper is reprinted, but a work of the size and importance of this deserves an index of its own.— W. DeW. M.

Ferry on a Collection of Birds from Costa Rica.[1]— This is an annotated list of 74 species collected by the author in Costa Rica during January, February, and March, 1908, at various localities on the Atlantic slope, mainly at Guaybo, Coliblanco, and Turrialba. The annotations often include interesting notes on the habits and haunts of a number

[1] Catalogue of a Collection of Birds from Costa Rica. By John Farwell Ferry, Assistant, Division of Ornithology. Field Mus. Nat. Hist., Orn. Ser., Vol. I, No. 6, pp. 257–282. "September, 1910."

of the species listed. The paper is posthumous, Mr. Ferry having died February 11, 1910, at the beginning of what seemed a promising scientific career (*cf.* Auk, XXVII, April, 1910, pp. 240, 241).— J. A. A.

'A Naturalist in the Bahamas.'— A volume with this title,[1] just published, contains a biographical sketch, by the editor, Professor Henry Fairfield Osborn, and the collected papers of the late Dr. John I. Northrop, who died, full of promise for an eminent career as a scientific investigator and teacher, at the early age of 29 years, June 25, 1891, his death resulting from the accidental explosion of alcohol. Dr. Northrop was interested in a wide range of subjects, including ornithology, and at the time of his death was an Associate of the American Ornithologists' Union. In 1890 he, with his wife, visited the Bahamas, where he spent six months in making collections in nearly all branches of natural history. Among the birds he obtained was a new species of *Icterus* (*I. northropi* Allen), described and figured in 'The Auk' (Vol. VII, October, 1890, pp. 344–346, pl. i, colored). He made a collection of 75 species of birds on Andros Island, an account of which was published by him, also in this journal (Vol. VIII, 1891, pp. 64–80). Besides these papers the present volume contains an account of the flora and a narrative of the Bahama trip by Mrs. Northrop, and a large number of papers by various specialists on the invertebrates collected by Dr. Northrop on the Bahama expedition, in addition to papers by Dr. Northrop and Dr. and Mrs. Northrop jointly, on a variety of scientific subjects — geological and botanical as well as zoölogical.

In Professor Osborn's appreciative notice of Dr. Northrop he states that the finished and unfinished work he left behind him "gave evidence of acute powers of observation, of painstaking study, and of strict regard for truth in the recording of facts"; and adds that he "had in mind the ultimate publication of a volume on the Bahamas which would embody the results of his work there and of other contemplated trips to the islands." The present memorial volume was planned to carry out this project, so far as possible, and it is hoped that through it "the memory of his labors and activities, brief as they were permitted to be, may live, and the influence of his example be handed down to future generations of the students of Columbia and of other universities." — J. A. A.

Cooke's 'Distribution and Migration of North American Shorebirds.'[2] — The 85 recognized forms of Shorebirds (Limicolæ) — 76 species

[1] A Naturalist in the | Bahamas | John I. Northrop | October 12, 1861–June 25, 1891 | A Memorial Volume | edited with a Biographical Introduction | by Henry Fairfield Osborn | [Seal of Columbia University] New York | The Columbia University Press | 1910 — 8vo, pp. xv + 281, with 37 plates and 9 text figures. The Macmillan Company, 66 Fifth Avenue, New York. $2.50 net.

[2] Distribution and Migration of North American Shorebirds. By Wells W. Cooke, Assistant, Biological Survey. Bulletin No. 35, Biological Survey, U. S. Department of Agriculture. 8vo, pp. 100, with 4 half-tone plates. Washington, Government Printing Office, 1910. Issued October 6, 1910.

and 9 subspecies — represented in North America are here treated in detail in respect to their migrations and general distribution throughout the year. Of these 85 forms 7 are found only south of the United States, 5 only in Greenland (in the Western Hemisphere), and 15 others occur only as stragglers from Europe and Asia, 58 belonging properly to the avifauna of North America north of Mexico. Of these 8 are Arctic and subarctic species that never visit the United States, and the breeding range of 36 others is wholly north of the United States.

In the introductory pages of this excellent summary the species are listed in twelve categories on the basis of their areas of occurrence in North America and their breeding and migration ranges. Following these a few pages are devoted to the general subject of the migration of Shorebirds, which in most cases make migratory journeys of over a thousand miles, and in some instances breed in arctic tundras and winter from the southern border of the United States south, according to the species, to the southern extremity of South America, some of them thus making semiannual migrations of 7,000 miles. The spring route is also different, in the case of some species, from that taken in the fall. The following statement is of special interest, since it is undoubtedly founded on thorough investigation: "Though many of the shorebirds breeding in North America winter in the southern parts of South America, none of them breed in their winter home. Special attention needs to be called to this fact, because nearly a dozen species of this family — among which may be noted particularly the Greater and Lesser Yellow-legs and White-rumped Sandpiper — have been reported as breeding near the southern end of South America. In no case has it been claimed that the eggs have been found, and all the records are based on the finding of young not fully grown or in most cases simply from the presence of individuals during the usual breeding season of local species. This latter reason is not even presumptive of breeding..."

The species are considered, in systematic sequence, with reference (1) to their breeding range, (2) their winter range, (3) their migration range, (4) the spring migration, (5) the fall migration. In the case of the Old World stragglers occurring in America, each is disposed of in a paragraph of ten or twelve lines, while from one to three pages are required to deal with the species of regular occurrence. The breeding range is given in considerable detail, while a few lines are sufficient to state the winter range, but both the spring and fall migrations are stated in very satisfactory detail as regards localities and dates; the more important records include the name of the authority for the record.

"The data," says the author, "on the breeding and wintering of the shorebirds has [have] been collected from all available printed sources, from the manuscript reports of the field naturalists of the Biological Survey, and from the specimens and catalogues of the United States National Museum. The dates of migration have been obtained principally from the migration schedules sent in by the several hundred observers in the

United States and Canada, who for a quarter of a century have contributed to the Biological Survey spring and fall reports of their migrations." It is needless to say that such extended resources have never before been available as the basis for such a study, and the present paper is worthy of the wide reputation Professor Cooke had already established as a specialist on the migration and distribution of North American birds. Four species are illustrated in as many half-tone plates, from drawings by Louis Agassiz Fuertes.

The "rapidly approaching extinction [of the Eskimo Curlew], if indeed any still exist," is thus accounted for: "A simple explanation is that during recent years, especially since 1880, its former winter home in Argentina has been settled and cultivated, while its spring feeding grounds in Nebraska and South Dakota have been converted into farm land." The species has been recorded, it is here stated, "only a few times" during the last fifteen years, "and apparently only three times in the ten years previous to 1909," — J. A. A.

Beck's 'Water Birds of the Vicinity of Point Pinos, California.' — This is an annotated list [1] of 94 species, based on the author's work as chief field assistant of the California Academy of Sciences, between May 1, 1903, and July 13, 1910, during which period "considerable time was spent in collecting water birds in the general vicinage of Point Pinos — Monterey Bay and the adjacent ocean." During most of these years Mr. Beck spent each year a number of months in quest of the water-fowl which frequent this part of the California coast during the fall, winter, and spring months, with the result that the Museum of the California Academy of Sciences has by far the most extensive collection of well-prepared specimens of these birds now extant. Mr. Beck's paper is a summary of the results thus obtained, and is hence a most welcome contribution to our knowledge of the winter distribution of these birds (Grebes to Plovers, both inclusive) along the California coast. The nomenclature is that of the third edition of the A. O. U. Check-List, except that subspecies are not recognized, so that we have the California Eared Grebe recorded as *Colymbus nigricollis*, the California Murre as *Uria troille*, and so on in all like cases.

Among the more interesting records it is noted that Xantus's Murrelet, although not now breeding north of Lower California, wanders north after the breeding season to Monterey Bay, where, in some winters, it is found in considerable numbers, it having been observed on nearly every trip from November 24, 1904, to February 4, 1905. It is also more than hinted that there is complete intergradation between *Brachyramphus hypoleucus* and *B. craverii*.

The Skua (*Megalestris skua*) is recorded as taken in Monterey Bay

[1] Water Birds of the Vicinity of Point Pinos, California. By Rollo Howard Beck. Proc. California Acad. Sci., ser. 4, Vol. III, pp. 57–72. September 17, 1910.

August 7, 1907, and attention is called to a previous overlooked record for the California coast made by the late George N. Lawrence in Vol. IX of the Pacific R. R. Survey Reports (1858, p. 838). The specimen, formerly in the Lawrence collection, is still extant in the American Museum of Natural History. The species, however, is not recorded for the Pacific coast in any of the editions of the A. O. U. Check-List.

Larus canus is again recorded for California, but, as in previous instances, doubtless on a misidentification of *L. brachyrhynchus*, which is not given, though a common species on the California coast in winter.

It is interesting to note that a small breeding colony of the Least Tern is reported as occurring at Moss, near the mouth of the Salinas River. *Fulmarus rodgersi* is confessedly recorded as *F. glacialis*! In the A. O. U. Check-List (3d ed.) *Puffinus bulleri* is recorded as: "*Range.*— New Zealand; north casually to California." Mr. Beck says: "Ten specimens have been taken by me in fall off Point Pinos, double the number recorded from New Zealand seas in Godman's 'Monograph of the Petrels.'" The Black Petrel (*Oceanodroma melania*) was found at frequent intervals and specimens taken from May 27 to September 14, 1907, though apparently not previously recorded north of the Santa Barbara Islands.

A species new to the North American fauna added by Mr. Beck is the Pink-footed Shearwater (*Puffinus carneipes* Gould), a bird not previously reported from the American side of the Pacific, of which Mr. Beck has taken ten specimens near Point Pinos, the first November 23, 1903, the second November 24, 1904, and others in February, April, June, August, September, and November, 1907.

Mr. Beck states that he has "freely incorporated" observations made by Mr. Loomis in his series of well-known papers on California waterbirds, and a number of the species are given on this basis, so that while the present list is mainly a summary of Mr. Beck's own work, it also includes species found by Mr. Loomis that the author of the paper failed to meet with.— J. A. A.

Townsend's 'A Labrador Spring.' — This volume[1] is of general as well as of ornithological interest, since it treats of the country in its varied aspects — of fishermen and fur traders as well as birds and plant life — and the phenomena attending the quick transition from snow banks to flowers in the rapid progress of spring in high latitudes.

The captions of the ten chapters convey some idea of its varied contents, namely: A Labrador Spring (pp. 1–35), From Seven Islands to Esquimaux Point (pp. 36–63), An Acadian Village (pp. 64–82), The Courtships of Some Labrador Ducks (pp. 83–102), The Cruise of 'La Belle Marguarite'

[1] A Labrador | Spring | By Charles W. Townsend, M. D. | Author of "Along the Labrador Coast," etc. | With illustrations from photographs [Seal] Boston Dana Estes & | Company MDCCCX — 12mo, pp. xi + 262, with numerous halftone plates. $1.50.

from Esquimaux Point to Natashquan (pp. 103–130), Three Modern Cartwrights (pp. 130–148), The Montagnais Indians (pp. 149–179), Wings and Feet in the Air and under Water (pp. 180–205), Some Labrador Trees (pp. 206–219), Some Labrador Rivers (pp. 220–250). Much of the ornithological matter had previously appeared in 'The Auk' (for April and July, 1909, and April, 1910), but the incidental and special references to individual species of birds which occur throughout the narrative portions of the work impart an ornithological flavor to much of the general text, while the nature lover and general reader will find throughout the volume matter of exceptional interest, presented in a spirit of sympathetic appreciation. The work is based on a five weeks trip in May and June, 1909, for recreation and study, and the author has been successful in rendering available to his readers a large share of the pleasure and intellectual profit of the journey. The fifty-six half-tone illustrations add greatly to the interest of the work, which is a worthy successor to the author's 'Along the Labrador Coast.' — J. A. A.

Hartert on the Proper Names of Various Species of British Birds.[1] — British conservatism in matters of technical nomenclature, especially in reference to British species of birds, has been incidentally the subject of remark in this journal on several recent occasions, in reviews of works dealing with British birds. Dr. Hartert, in the present paper, however, confines his attention to a few special cases, namely the correct names of White's Thrush, the Song Thrush and Redwing, the Black-throated and Eared Wheatears, the Black Redstart, British Wrens, British Dippers, and the generic names of the British Swallow and House Martin.

On grounds of priority, it is shown that the name of White's Thrush should be *Turdus aureus* and not *T. varius*; the Song Thrush should be called *Turdus musicus* (not *T. iliacus*) and the Redwing *T. philomelos* Brehm, and the British form of this species *T. philomelos clarkei* Hartert. The Black-throated and Eared Wheatears are declared to be only dimorphic forms of the same species; and that while hitherto known respectively as *Saxicola stapazina* and *S. aurita*, the proper name for the species is *S. hispanica* (Linn., 1758).

The name of the Black Redstart is changed from *Ruticilla tithys* to *Phœnicurus ochrurus gibraltariensis*, since *Phœnicurus* antedates *Ruticilla*, and the British form is a subspecies of the Caucasian *P. ochrurus*. The name *tithys* usually employed for the British bird, was based on a female of the Common Redstart (*P. phœnicurus*).

The British Wrens are considered referable to the genus *Troglodytes*, *Nannus* Billberg being regarded as too slightly different to be entitled to generic separation. Three British subspecies of *N. troglodytes* are recognized, and also two British subspecies of the Dipper.

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[1] Notes on Various Species of British Birds. By Ernst Hartert. British Birds, Vol. IV, No. 5, October 1, 1910, pp. 129–136.

The question of the generic names of the Swallows is of more than local interest. Hartert accepts Forster's division of the Linnæan genus *Hirundo*, namely, *Chelidon* for *H. rustica*, *Riparia* for *H. riparia*, and *Hirundo* for *H. urbica*, as was done by the A. O. U. Nomenclature Committee in 1886 and 1895. Later Sharpe assumed that Schæffer, in 1774, fixed the type of *Hirundo* as *H. rustica*, which view was later accepted by numerous authorities, including the A. O. U. Committee. Only within the last few months, however, has the present writer had an opportunity to examine Schæffer's work, and his treatment of the genus *Hirundo*. A careful study of this work makes it evident to us that he did not, in any true or acceptable sense, fix the type of *Hirundo* or of any other genus.— J. A. A.

Gladstone's 'The Birds of Dumfriesshire.'[1]—The avifauna of Dumfriesshire numbers 218 indigenous species, of which 56 are given as "very rare or accidental visitors," while 29 others are entered as of doubtful occurrence; 10 others are included as introduced species. The author has followed the classification and nomenclature of Howard Saunders, except in the case of geographical races, where trinomials and the nomenclature of Dr. E. Hartert are employed.

It is a very comprehensive work in all that relates to the manner of occurrence of the species of birds in Dumfriesshire. The general character of the presence of each is summarized in a line or two of small heavy-faced type as a sort of heading to the detailed account which immediately follows, with references in footnotes to the authorities on which the various statements in the text rest, when not based on the personal knowledge of the author.

The introduction includes short biographies of the ornithologists of Dumfriesshire (pp. xxv–xlii), a list of correspondents who have assisted the author in the work, an extended bibliography (pp. xlix–lxiii), a sketch of the physical features and climate of Dumfriesshire (pp. lxv–lxxvii), a few pages on bird migration as observed in the county, two pages on 'flight-nets' as used by fishermen in capturing wild-fowl, six pages on bird protection (including "The Wild Birds Protection Order" of 1908 for the County of Dumfries), a few pages of "local misnomers and names," and three pages on the number of species recorded for Dumfriesshire, and the method of their treatment in the 'Birds of Dumfriesshire," which occupy the rest of the volume (pp. 1–472). The illustrations include, besides a large folding map of the county (printed in colors to show contours of altitude), twenty-four finely executed half-tone plates, representing

[1] The Birds | of | Dumfriesshire | a contribution to the Fauna of the Solway Area | By | Hugh S. Galdstone | M. A., F. Z. S., F. R. S. E., M. B. O. U. | President of the Dumfriesshire and Galloway Natural History | and Antiquarian Society. | With illustrations from photographs | by | Messrs. D. Legard, F. Barber-Starkey, the Author | and others, and a map. | Witherby & Co. | 326 High Holborn London | 1910 — 8vo. pp. xcix + 482, 24 half-tone plates, and a folded map. Edition, 350 numbered species. 25s. net.

scenic features of the county, nests and eggs, and birds from life or from historic specimens. The volume is beautifully printed on heavy unglazed paper, and forms an attractive and important addition to the series of works relating to local faunas in the British Isles.— J. A. A.

Report on the Immigration of Summer Residents in England and Wales in the Spring of 1909.[1]— This is the Report (the fifth of the series) of the Committee of the British Ornithologists' Club on the spring immigration of the summer resident birds into England and Wales in the spring of 1909, and on migratory species observed in the Autumn of 1908. In respect to the species reported upon and in form of treatment the present report conforms closely to its predecessors, previously noticed in this journal, although containing about one third more pages, due mainly to a fuller treatment of the autumn records. The stream of spring migrants, while "fairly continuous," was at its height from the 9th of April to the 13th of May, with the usually large 'waves.' "The main immigration took place on the 9th, 17th and 25th of April, and on the 2nd–5th, 10th and 13th of May, the largest on the 17th of April, when the arrival of at least twenty species was observeed."— J. A. A.

Beetham's 'The Home-Life of the Spoonbill, the Stork and Some Herons.' — This is the second volume[2] of the "Home-Life" series, published by Witherby & Co., the first being Macpherson's 'The Home-Life of a Golden Eagle,' already noticed in these pages (Auk, XXVII, Jan. 1910, pp. 101, 102). The present volume treats of the Spoonbill, the White Stork, the Common Heron, and the Purple Heron. These four species were carefully studied and photographed from screens or blinds erected near nests, and the text and accompanying beautiful illustrations are an important contribution to the life histories of these species. The author takes us to the haunts of these birds, without however telling us just where he found them, but the setting and the allusions indicate, at least for three of the species, the marshes of Holland.

Of the Spoonbill the author says: "The manner of feeding was quite distinct from that of the cormorant-like birds, where the young thrust their heads far down their parents' distended gullets, for here the food was regurgitated into the top of the throat and the trough at the base of the lower mandible, whence the young could pick it out without their heads

[1] Report on the Immigration of Summer Residents in the Spring of 1909: also Notes on the Migratory Movements and Records received from Lighthouses and Light Vessels during the Autumn of 1908. By the Committee appointed by the British Ornithologists' Club. = Bulletin of the British Ornithologists' Club, Vol. XXVI, October, 1910. Edited by W. R. Ogilvie-Grant. 8vo, pp. 347.

[2] The Home-Life | of the | Spoonbill | the Stork and some Herons | Photographed and described | by | Bentley Beetham, F. Z. S. | With thirty-two mounted Plates | London Witherby & Co., 326 High Holborn, W. C. | MCMX.— Large 8vo., pp. viii + 47, with 32 plates. 5s.

entering the throat at all." The closing paragraph of the account notes the "tone of gentleness" of these birds, and their "silent dignity," but adds: "True, to be exact, their silence is more a necessity than a virtue, since they are possessed of no true vocal organ, but it so befits their other actions that it may well be laid to their credit without too close examination."

In the home-life of the Common Heron its checkered history is noted. In early times it was protected as royal game, but since the breechloader has ousted the falcon, he is no longer *protected* to be *destroyed*, but *from* destruction, since the angling fraternity are now "clamoring loudly for his blood."

Mr. Beetham's narrative is entertainingly written and adds greatly to our knowledge of the intimate home-life of these shy and interesting birds, while the beautiful photographic plates add a realism that no amount of word-painting can supply.— J. A. A.

Simon on the Hummingbirds of Ecuador.[1] — Ecuador is divided into three regions, (1) the low hot region between the Pacific and the western Cordillera, (2) the area between the two Andean ranges, and (3) the basins of the Rio Napo and Rio Pastassa. The characteristic forms of Hummingbirds of each are indicated and the ranges of various genera, as represented in the three districts, are commented upon. The list numbers 152 species, with notes on their ranges, and with pertinent technical comment. *Taphrospilus* is proposed as a new genus, with *Aphantochroa hyposticta* Gould as type; *Prasitis vitticeps* is described as new. The catalogue is a valuable contribution to our knowledge of the species of Hummingbirds thus far recorded from Ecuador and of their distribution.— J. A. A.

Gunning and Haagner's 'A Check-List of the Birds of South Africa.'[2] — The northern boundary of the area here included is approximately latitude 16° S., or "a line formed by the Cunene River on the east and the Zambesi River on the west." As said in the Introduction, Dr. Reichenow's 'Vogel Afrikas' is taken as the basis of the list, this being "the only complete modern work on African Ornithology, and as he has evidently bestowed much time and care on the subject of the nomenclature of South African birds. Where we have cause to differ from Dr.

[1] Catalogue général des Trochilidés observés jusqu'a ce jour dans la Republique de l'Écuador. Par E. Simon. Revue Française d'Ornithologie, Nos. 17 et 18, Sept.–Oct., 1910, pp. 257–270.

[2] A Check-List of the Birds of South Africa, Being a record of all the species known to occur south of the Zambezi-Cunene line (the 16th degree of south latitude). By Dr. J. W. B. Gunning, President, South African Ornithologist's Union, and Alwin Haagner, F. Z. S., Colonial Member, British Ornithologists' Union, Honorary Member, Royal Hungarian Bureau of Ornithology, Honorary Secretary, South African Ornithologists' Union. Annals Transvaal Museum, Vol. II, July, 1910, Suppl., pp. 84.

Reichenow's conclusions we have added in the Appendix [pp. 75–84] explanatory notes; as is also the case with all additions to the Avifauna of South Africa since Mr. Sclater's Check-List was published."

The list begins with the family Struthionidæ and ends with the family Turdidæ. The names of families and genera are given and the authority and date of the latter and of species and subspecies, but the names of the orders are omitted. The technical names of the species and subspecies are followed by vernacular names, both English and Dutch, and a reference to Reichnow's and Sclater's works. Trinomials are used for subspecies, and the subspecies are numbered consecutively with the species, the numbers running to 920, with four interpolated numbers making a total of 924. No references are given to the place of description for either the genera or species, nor is the range given. The list is thus nearly the same in character as the American Ornithologists' Union 'new Abridged Check-List of North American Birds.'

We note that Brissonian genera are adopted so far as they occur in the South African avifauna, and are duly accredited to him, and that in only one instance is a genus wrongly ascribed to him, namely, *Emberiza*, which dates from Linnæus, 1758, and not from Brisson, 1760, although employed by Brisson independently of Linnæus, as was also *Vultur*, sometimes also wrongly assigned to Brisson. *Hydrobates* is employed as the generic name of the Storm Petrel instead of *Thalassidroma*. *Hydrobates* Boie, Isis, 1822, p. 562 (not *Hydrobata* Vieillot, 1816) contained two species, without designation of type. These are *Procellaria pelagica* Linn. and *P. leachii* Temminck. *P. pelagica* became the type of *Thalassidroma* Vigors in 1825, by original designation. This left in *Hydrobates* only *P. leachii* (Temminck 1820 = *P. leucorrhoa* Vieillot, 1817), which later became the type of *Cymochorea* Coues, and is congeneric with the type (*P. furcata* Gmelin) of *Oceanodroma* Reichenbach. Hence *Hydrobates*, if available for use, should replace *Oceanodroma*, and *Cymochorea* becomes a homonym of *Hydrobates*.

The nomenclature is in accord with modern rules, but in a few instances the names or authorities are not those commonly in use, the authority for *Riparia* being given as Vorst, 1817 instead of Forster, 1817 (probably a typographical error for Forst.), and *Delichon* Moore, 1854, is used for the House Martin instead of *Chelidonaria* Reichenow, 1889; and a few other departures from current usage are noticeable, but doubtless rest on good grounds.

Although the ranges of the species and subspecies, and references to original descriptions, are omitted, the list furnishes a handy up-to-date catalogue of South African birds, compressed into less than a hundred pages.— J. A. A.

Rubow's 'The Sea Gull.'—This is a brochure [1] of twenty-five beautifully executed half-tone illustrations and three pages of text, devoted to the life-history of the common Sea Gull of Europe as seen in Denmark. The series of illustrations begins with a mated pair of birds shown standing on a sea-girt rock; this is followed by views of a breeding colony on their nests; by single nests with eggs, amid natural surroundings; sitting birds on nests; nests with the eggs hatching; newly hatched young birds with the parent birds in attendance; young birds at a later stage of development; a flock of adult birds in the air over a field, searching for insect larvæ as exposed by a farmer in plowing; the series closing with views of small parties of gulls perched on rocks along a seashore or flying in the air. The text (in Danish) tells briefly the story so fully and beautifully illustrated in the plates. The brochure as a whole is exceedingly artistic, both plates and text being printed on heavy clear white plate paper, and bound in paper of a similar quality but of a pale blue-gray tint; the cover title is bordered with deep blue waved lines and the title printed in deep blue and black. Rarely have we met with a more pleasing and tastefully made ornithological booklet.— J. A. A.

Mathews's 'The Birds of Australia.' [2] — Volume I, Part 1, of this great work on Australian Birds was issued October 31, 1910. The work is published by subscription, by the well-known London publishers, Witherby & Co., and it is announced that "at least four parts will appear each year." The first part contains the Casuariiformes (5 species), the Galliformes (9 species), and the Turniciformes (7 species), or a total of 19 species, each illustrated. The first seven volumes (to form 30 parts), as announced in the prospectus, will carry the work to the Passeres, which, comprising some 450 species, will occupy Volume VIII and the succeeding volumes to the end of the series.

Since the completion of Gould's 'Birds of Australia,' in seven folio volumes (1841–1848, with five supplementary parts, 1851–1869), half a century ago, many species have been added to the avifauna, and a vast amount of new information recorded respecting the life histories and distribution of Australian birds. It is the purpose of the author of the present work to bring together as complete an account of each species as possible, availing himself of all published information as well as the results of his own personal observations, and the assistance of field ornithologists

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[1] Dansk Fugleliv | Stormmaagen | (Larus canus) | The Seagull, Die Sturmmöve, La Mouette cendrée | Dens Liv i Billeder. Fotograferet efter Naturn | af | C. Rubow | [Seal] Gyldendalske Boghandel | Nordisk Forlag | Forlagets Bogtrykkeri | MDCCCCX — Large 8vo, title page, 18 half-tone plates, 3 pp. text (unpaged).

[2] The | Birds | of | Australia | By | Gregory M. Mathews | Member of the Australian Ornithologists' Union and the | British Ornithologists' Union | With hand-colored plates | [Vignette] Volume I. Part 1. | London: | Witherby & Co. 326 High Holborn W. C. | October 31st 1910 — Royal 4to, pp. 1–96, pll. (colored), i–xix. Edition, 300 numbered copies. Price, £2, 2 s. per part.

in all parts of Australia. Each species will be illustrated from drawings by the best bird-artists available, and the plates will be carefully hand-colored.

An examination of Part I shows that the character of the work as announced in the prospectus has been well sustained. Of the plates, it is enough to say that with one exception, all have been drawn by J. G. Keulemans, and the text is well up to date. The bibliographical references are reasonably complete and the nomenclature modern; there are keys to the genera and species, and the descriptions (in small type) are very full, including those of the downy chick (when known), as well as of immature and fully adult birds, and of the nest and eggs. This is followed (in larger type) by the general account of the species, including its literary as well as its life history, with copious extracts from standard authorities. The account of the Emu thus occupies ten pages, and that of the Mallee Fowl twelve pages, while a couple of pages suffices to tell the little that is known of several of the species of *Turnix*, or so-called quails, the life histories of which are still almost unknown.

Mr. Mathews seems to be well prepared for his great task, having lived all his life in Australia and been a devoted student of its avifauna. In 1908 he published a 'Hand-list of the Birds of Australia' as a preliminary to the present illustrated work, and is in touch with a large number of field ornithologists in various parts of Australia from whom he is constantly receiving valuable observations hitherto unpublished. He also has the hearty co-operation of Dr. Ernst Hartert of the Rothschild Museum at Tring, who will render important aid in the technical and historical aspects of the work.

The illustrations, it is announced, will be by H. Grönvold, J. G. Keulemans, E. E. Lodge, and other noted bird draughtsmen. The part now under notice is a guaranty of the excellent character of the work, and we wish the author every support and the success this immense undertaking surely deserves.— J. A. A.

Bird Enemies of the Texas-fever Tick and other Ticks.— Mr. Robert Newstead of Chester, England, who has made numerous specific, hence valuable contributions to economic ornithology, maintains his satisfying standard in some observations[1] on the enemies of Ticks in Jamaica. While Gosse,[2] Taylor,[3] Ober,[4] and others record the fact that the Tinkling Grackle (*Quiscalus crassirostris*), and the Parrot-billed Blackbird (*Crotophaga ani*) feed upon cattle ticks, with the exception of Ober, they content themselves with evidence derived from the testimony of others or from merely watching the birds. Newstead, however, by means of post mortems gives us definite information regarding the species and the numbers of ticks eaten. He briefly treats other items of food also.

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[1] Bull. Jamaica Dept. Agr., Vol. I, No. 3, 1910, pp. 161–165.
[2] Birds of Jamaica, 1847, pp. 284–285.
[3] Auk, IX, 1892, pp. 369–370.
[4] Proc. U. S. Nat. Mus., (1878) 1879, p. 193.

The contents of the stomachs of 6 Tinkling Grackles were analyzed by him; they contained ticks as follows: No. 1, 25 Texas-fever ticks (*Margaropus annulatus australis*) and 3 silver ticks (*Amblyomma cajanense*); No. 2, 74 Texas fever ticks; No. 3, 13 Texas-fever ticks; No. 4, 32 *Margaropus*; No. 5, 3 *Amblyomma* and 2 *Margaropus*; and No. 6, 7 *Margaropus*. The total number of ticks found in the 6 birds was 159. Newstead remarks that "as these were all females, it will be seen that had they been left to mature, that they would have produced between them over 1,000,000 eggs, or a corresponding number of young grass lice, so that the value of the Tinkling as a tick destroyer cannot be overestimated."

On several occasions the Parrot-billed Blackbirds or Anis were seen to take ticks (probably *Amblyomma cajanense*) from the heads of horses, and one Texas-fever tick was found in each of two collected stomachs of this species.[1] Domestic fowls also are said to feed on the cattle ticks to a marked extent.

Birds closely related to the Jamaican species above mentioned, namely the Groove-billed Ani (*Crotophaga sulcirostris*) and the Red-winged Blackbird (*Agelaius phœniceus*) are said [2] to prey upon Texas-fever ticks in Mexico. In Costa Rica also, according to Cherrie,[3] the Groove-billed Ani habitually feeds upon cattle-ticks. The habit is so marked in fact that they are called garrapateros in all Spanish American countries. Tick bird is in use in the West Indies and even the scientific name of the genus has reference to their obvious taste for ticks.

In the United States, Jackdaws (*Megaquiscalus major macrourus*) and Kingbirds (*Tyrannus tyrannus*) are recorded [4] as enemies of Texas-fever ticks. Mr. H. S. Barber informs me that he observed Red-eyed Cowbirds (*Tangavius æneus involucratus*), Boat-tailed Grackles and another species of Blackbird habitually attending cattle near Brownsville, Texas, and securing ticks by springing up from the ground and pulling them from the bellies of the animals. Sometimes the birds failed to get the ticks, but left their torn bodies attached to the skin. It was a matter of common knowledge that these bloody remains offered a favorable and oft used place for deposition of the eggs of the screw-worm fly (*Chrysomyia macellaria*). It is very doubtful, however, that any considerable proportion of screw-worm infestation takes place in this way. Eastern Cowbirds (*Molothrus ater*) also are said by Bendire [5] to eat ticks.

In the course of stomach examinations by the Biological Survey, the

[1] The contents of all the stomachs here noted, as well as those of one bird of each species which had not eaten ticks, are very fully determined, and the economic relations of the various items given. Brief notes on the food of four other species of birds also are presented. They refer to *Centurus radiolatus*, *Platypsaris niger*, *Todus viridis* and *Tyrannus caudifasciatus*.

[2] Moreau, P. L. Circ. Num. 66, Com. de Parasit. Agr. Mex., 1907, figs. 8–9.

[3] Auk, IX, 1892, p. 325.

[4] Hunter, W. D. and Hooker, W. A. Bull. 72, U. S. Bureau Ent., 1907, p. 37.

[5] Life Histories of N. A. Birds, Part II, 1895, p. 435.

following birds have been found to eat ticks; those eating Texas-fever ticks are: Killdeer (*Oxyechus vociferus*), Upland Plover (*Bartramia longicauda*), and Meadowlark (*Sturnella magna*); net ticks (*Dermacentor occidentalis*): Dwarf Hermit Thrush (*Hylocichla guttata nana*); castor-bean ticks (*Ixodes* sp.): Boat-tailed Grackle (*Megaquiscalus major*), Meadowlark, and House Wren (*Troglodytes aëdon*); and *Gamasus* sp.: the Wren-tit (*Chamæa fasciata*).— W. L. McA.

Economic Ornithology in recent Entomological Publications.— The greater prominence given to bird enemies of insect pests in recent entomological publications is a source of gratification to bird lovers. Increased recognition of the services of birds is common to both State and Federal entomological organizations, and in recent bulletins of the U. S. Bureau of Entomology, in particular, comment on the relations of birds to the insects discussed is seldom lacking.

Four papers on cereal and forage insects issued by the Bureau of Entomology during the present year include notes on birds in the discussion of natural checks of the insects treated. Fourteen species of birds, which the Biological Survey has found to feed on the clover-root curculio (*Sitones hispidulus*) are listed in Mr. V. L. Wildermuth's bulletin [1] on that beetle, and the statement is made that "natural enemies, such as fungous disease and birds, have without a doubt contributed largely towards holding the insects in check."

The clover-root curculio belongs to a genus of beetles closely related in appearance and habits, which do a large amount of obscure damage, principally to clover. Few genera of beetles occur more frequently in bird stomachs than *Sitones*. Six species are known to be eaten and *Sitones* unidentified as to species have been found in the stomachs of 49 species of birds. On account of the present more complete indexing of Biological Survey records ten species can be added to the list of 14 Wildermuth gives as enemies of *S. hispidulus*. The complete list is: Upland Plover, Killdeer, Ruffed Grouse, Broad-winged Hawk, Flicker, Nighthawk, Chimney Swift, Wood Pewee, Crow Blackbird, Meadowlark, Lincoln Finch, Song Sparrow, Chipping Sparrow, White-throated Sparrow, Purple Martin, Barn, Tree and Bank Swallows, Northern Water-Thrush, Catbird, Chickadee, Hermit Thrush, Robin and Western Bluebird.

The English Sparrow comes in for condemnation along with an insect pest in an article [2] by W. Harper Dean on the sorghum midge (*Contarina sorghicola*). Both the bird and the insect curtail the number of sound mature seed produced, so that in parts of many sorghum-growing States a profitable crop cannot be secured. The work of the sparrow is much less important than that of the fly. Sorghum heads partly destroyed by

[1] Bull. 85, Part 3, Bur. Ent., March, 1910, p. 37.
[2] Bull. 85, Pt. 4, Bur. Ent., May, 1910, pp. 39–40.

both agencies are illustrated (fig. 20). On page 57 of the same publication it is stated that a hummingbird (probably *Trochilus alexandri*) was seen hovering about the heads of sorghum and to all appearances feeding on the midges.

Mr. C. N. Ainslie [1] comments on the natural enemies of the New Mexico range caterpillar (*Hemileuca oliviæ*), a pest which has wrought steadily increasing damage for several years. Mr. Ainslie mentions seeing several Robins feeding on the caterpillars and adds (p. 95): "The importation of birds to feed on the caterpillars has been suggested, but in the infested regions the wide treeless plains afford but little encouragement for nesting birds. Besides this, it is a lamentable and criminal fact that in spite of laws that are designed for the protection of bird life in New Mexico, a constant and indiscriminate slaughter of all sorts of birds is in perpetual progress until the companionable species and those of high economic importance have been practically exterminated in many parts of the Territory. This condition of things may possibly account, in some measure, for this *Hemileuca* invasion, and may in the not remote future bring into prominence other insects now few and harmless, but multiplying because their bird foes have perished at the hands of hunters. This bids fair to become a serious matter, and not alone in New Mexico."

The store of information about bird food in the Biological Survey, the accumulation of 25 years of research, is again drawn upon for a list of the bird enemies of crane flies (Tipulidæ). The depredations of these insects range from local injuries in pastures and hayfields to the devastation of thousands of acres of grain crops and grass lands. Eighty-six species of birds are known to feed upon Tipulids and their eggs, showing a preference for these pests, that should be given substantial appreciation. "Among the birds which are known to feed upon the Tipulidæ, either as eggs, larvæ, or adults, probably the most important are the Wood Thrush (*Hylocichla mustelina*), the Alice Thrush (*Hylocichla aliciæ*), the Catbird (*Dumetella carolinensis*), the Robin (*Planesticus migratorius*), and the Crow (*Corvus brachyrhynchos*). Of the total stomach contents of 22 specimens of the Wood Thrush, examined at the Illinois State Laboratory of Natural History, 12 per cent was made up of tipulid fragments, while 11 specimens of the Alice Thrush contained 8 per cent of tipulid fragments." [2] An important publication of the Bureau of Entomology deals with 'Plant Bugs Injurious to Cotton Bolls.' [3] While no specific mention of bird enemies is made, space is given to a discussion of the prevalent idea that the offensive odor of bugs protects them from birds. "Without this supposition" the author says, "the object and origin of odoriferous glands may be difficult to explain, but studies in the feeding habits of

[1] Bull. 85, Pt. 5, Bur. Ent., June, 1910, pp. 93 and 95.
[2] Hyslop, James A. Bull. 85, Part 7, Oct. 1910, p. 129.
[3] Morrill, A. W. Bull. 86, June, 1910.

insectivorous birds have shown that in most cases Pentatomid bugs are eaten at least to the extent of the proportion of their numbers to the numbers of other insects of the same and larger size. Further, it would seem that some birds, like the Crow, possess a predilection for insects of pungent or otherwise strong taste or odor. Careful studies have been made of the feeding habits of about 20 common American birds. Almost without exception Pentatomids (variously referred to as 'stink bugs,' 'soldier bugs,' and 'Pentatomids') are included in the diet of each of these birds, amounting on the average to about 3 per cent of all the food." The experience of the division of Economic Investigations of the Biological Survey is all to the effect that human criteria of taste can in no way be applied to birds. Failure in this respect has led to many fallacious statements concerning birds, one type of which relates to the bad taste of certain insects. None are more offensive to man than the stink bugs (Pentatomidæ). Nevertheless these insects are attacked by a great variety of birds and sometimes large numbers of them are consumed. Taking as a guide the amount of space occupied by cards in the Biological Survey food index, the Pentatomids are more relished by birds than any other family of Hemiptera and what is more surprising, than any family of Orthoptera which certainly rank as staple bird food. Dr. Morrill says: "Thus far no specific observations have been made for the purpose of determining the extent to which birds feed upon the conchuela [that is, *Pentatoma ligata*]. It is evident, however, that there is some important influence combined with egg parasitism to produce in midsummer the marked reduction in number of these insects observed both in Mexico and in Texas. The egg-parasites effectually check the multiplication of the pest after the month of July, but the diminution in numbers of the adults remains unexplained. In the laboratory, protected from their enemies, the life of the adult conchuela extends over many weeks, 27 specimens collected at Tlahualilo between July 6 and July 10 averaging over two months each.

"It is inconceivable that the difference between field and laboratory conditions should be so great that, of the insects of the field on July 10, over 60 per cent should die from natural causes before August 1, while in the laboratory less than 5 per cent should die during the same period. Furthermore, if the numerical decrease in question had been due to natural exhaustion of vitality of the adult insects, it would be expected that many dead specimens would have been found in the cotton fields. As a matter of fact, dead specimens were exceedingly rare and the few found gave evidence of having been destroyed by some enemy rather than of having died from natural causes. As has been shown, the decrease in numbers is a general and not a local occurrence, and it takes place without regard to the abundance of food. These circumstances seem to point to the strong probability that birds are the useful agents in the reduction of the numbers of the adults of the conchuela."

Another supposedly distasteful insect, the yellow-bear caterpillar (*Diacrisia virginica*), became injuriously abundant in the Upper Arkansas Valley, Colorado, in 1909. H. O. Marsh, who investigated the outbreak says:[1] "A remarkable feature of this outbreak is that the larvæ had so few natural enemies. Birds did not eat them, and with the exception of a few individuals which were killed by parasites and disease they appeared to be unmolested." It should not be inferred from this that birds never eat these very hairy caterpillars. As a matter of fact the Bobwhite[2] and the Black-billed Cuckoo[3] are already recorded as feeding on them.

The Chief of the Bureau of Entomology, Dr. L. O. Howard, begins a new comprehensive series of publications on mosquitos with a bulletin entitled 'Preventive and Remedial Work against Mosquitos.' Ten pages are devoted to mosquito consumers such as salamanders, dragon-flies, predaceous mosquitos and fish. As this chapter discusses only the practical use of natural enemies of mosquitos, birds, not being susceptible to such use, are omitted. The fact that such a good general discussion of mosquito enemies other than birds is available, makes it desirable to give a hint at least of the number and kinds of birds that must be included in any complete survey of the natural enemies of mosquitos. In the report[4] of the Chief of the Biological Survey for 1908 the Chimney Swift (*Chætura pelagica*), Nighthawk (*Chordeiles virginianus*), Northern Phalarope (*Lobipes lobatus*) and Killdeer (*Oxyechus vociferus*) are named as mosquito eating birds. Other Biological Survey records are for Wilson's Phalarope (*Steganopus tricolor*), Pectoral Sandpiper (*Pisobia maculata*), Baird Sandpiper (*Pisobia bairdi*), the Bank Swallow (*Riparia riparia*) and the Wren-tit (*Chamæa fasciata*). John B. Smith states[5] that numbers of the larvæ of the salt marsh mosquito (*Aedes sollicitans*) were found in the stomachs of the Ring-neck Plover (*Ægialitis semipalmata*), the Least Sandpiper (*Pisobia minutilla*) and the Semipalmated Sandpiper (*Ereunetes pusillus*). In fact shorebirds in general seem to be especially fitted both by habits and tastes to be the most important enemies of mosquito *larvæ* among birds. Birds which feed on the wing naturally capture the most adult mosquitos. Such enemies include the Purple Martin (*Progne subis*),[6] Cliff Swallow (*Petrochelidon lunifrons*),[7] Bank Swallow (mentioned above), the Tree (*Iridoprocne bicolor*)[4] and Barn Swallow (*Hirundo erythrogastra*)[8] Chimney Swift, Whip-poor-will (*Antrostomus carolinensis*),[9] and Nighthawk. Stomachs of the Cuban Nighthawk (*Chordeiles virginianus minor*)

[1] Bull. 82, Pt. 5, Bur. Ent., Aug., 1910, p. 62.
[2] Bull. 21, Biological Survey, 1905, p. 45.
[3] Bull. 9, Biological Survey, 1898, p. 14.
[4] Ann. Rep. Dept. Agr., 1908, p. 577.
[5] Report on the Mosquitos of N. J., 1904, pp. 85–86.
[6] Port Jefferson, N. Y. Echo, Aug. 17, 1901.
[7] Merriam, F. A. Birds of Village and Field, 1898, p. 54.
[8] Forbush, E. H. Useful Birds and Their Protection [1907], pp. 345–346.
[9] Howard, L. O. Bull. 25, U. S. Div. Ent., 1900, p. 49.

examined by Allan H. Jennings on New Providence were distended with mosquitos.[1] The stomachs of a few warblers at the time were also full of mosquitos. Other birds recorded as consumers of mosquitos are Wood Pewee (*Myiochanes virens*), Phœbe (*Sayornis phœbe*), and Kingbird (*Tyrannus tyrannus*).[2]— W. L. McA.

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[1] Proc. Ent Soc. Wash., X, 1908, p. 61–62.
[2] Forbush. loc. cit., pp. 232, 235 and 238.

melt wurden. (Aus dem LXXVI Bande der Denks. der Mathem.-Naturwiss Klasse der Kaiserl. Akad. Wissens., 1910. 4to, pp. 46.)

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CORRESPONDENCE.

The Extermination of the Wild Turkey in the State of Virginia.

EDITORS OF 'THE AUK':

Dear Sirs: — Recently in conversation with a friend, and Ex-Congressman, and one greatly interested in the game and game laws of the State of Virginia, I gained some reliable information in regard to the present status of the Wild Turkey in that section of the United States, which was a surprise to me, and may be to other ornithologists who have not of late especially investigated that subject. It is a well-known fact that many years ago in all the wilder and, for the turkey, suitable parts of the State of Virginia, this species was to be found there in great numbers. Indeed, it is well within my recollection when one had to go but a very short distance from Washington, D. C., into Virginia, in the forest regions, to find Wild Turkeys more or less abundant, and the hunters shot them there and brought them to the Washington Markets. My friend informs me that only fifteen years ago they were fairly abundant in Rappahannock County, less than one hundred miles from Washington, which is a division of the State where not one is at this writing to be found. What is true of Rappahannock County is probably more or less true for the entire State of Virginia, and as Virginia is a State that has not settled up very rapidly, the reason for the comparatively sudden disappearance of this bird there must be attributed to some other cause rather than to the encroachment of man on its domain, which cause invariably proves fatal to the existence of any wild form upon which he preys,— either for food or for other purposes. After fair and extended investigation my informant is of the opinion that the blame for the practical extermination of this magnificent American game bird in the region indicated is to be laid at the door of the negro who prowls through the forests of that part of the country. There the negro is essentially a savage and a squatter, living in a primitive cabin in the timbered sections, and existing upon what these forests afford him.

The male Virginia negro there has risen but very little above his African ancestors, and still possesses all of the undesirable qualities of the latter. If one passes through this wilderness, the former home of the Wild Turkey, he will, ever and anon, meet with one of these negro men. Solitary and silent, clad in his tattered garments, and carrying a primitive, single-barrel gun with its ammunition, he roams about like a veritable savage that he essentially is, seeking to slay any living creature that may afford him food, and mitigate the pangs of his almost ever-present hunger. He barely notices you as you pass him, and later on you may hear the boom of his big-bored fowling piece, perhaps nigh a mile away, and wonder to your heart's content as to the kind of animal he has slain.

At a time when the Wild Turkeys were rapidly disappearing in this part

of Virginia and these solitary negroes roamed through her forests, they frequently passed through the better part of two or three days without a mouthful to eat. Especially was this the case in the spring-time when the few remaining birds undertook to breed. Persistent persecution at the hands of these negroes had apparently rendered the birds more and more secretive with respects to the sites they selected for nests wherein to deposit their eggs. This increased secretiveness, however, had but the effect of sharpening the wits of these negro prowlers for sustenance, and, frequently suffering from long-prolonged hunger, in every instance, sooner or latter, the much desired Wild Turkey's nest of eggs was discovered, and every one of the latter promptly consumed to appease his voracity. It goes without the saying as to what *must* happen if the eggs of any bird in nature be continually destroyed. But these negroes by no means stopped here, for if any one or more of these hen turkeys chanced to hatch out her brood, she was pretty certain to be met with by one of these merciless hunters, and fall a victim, chicks and all, to his rapacious appetite. So much for the criminality of this class of negroes and their lack of regard for the State game laws during the breeding season of the Wild Turkey.

When these fowls came to flock, or at the mating season, the ingenuity of these game destroyers,— these law-breaking negroes,— knew no limit. The places where the turkeys congregated or where they were in the habit of roosting, were easily discovered, and a most fatal design of trap was set for them in each and every locality. So simple, so inexpensive, so sure of result was the means employed to capture the birds at these times that their destruction was effected with great rapidity. They were simply baited, and baited in two ways, depending upon circumstances. For instance, let us select one of the many localities in the forest where the turkeys roosted in the trees, and where in the morning and early evening they fed and strutted and walked about on the ground, in the neighborhood. To capture them, these negroes employed only a very small fish-hook firmly attached to the end of a long piece of pliant, dark-colored twine, of sufficient strength to hold his victim. When the hook and line was set up in one of the roosting-trees it was baited with a soft piece of dough about the size of a small acorn. In the tree where the turkeys roosted, parallel limbs were selected, the one being some three or four feet above the other. Through previous observation the negro had become aware that a turkey was in the habit of roosting on the lower limb, and by running the twine over the upper one and suspending the bait where the bird could conveniently reach it, the remainder of the line was cunningly concealed through the tree and finally firmly fastened to a peg in the ground beneath. What follows is easily imagined, and hundreds of Wild Turkeys have been captured and killed by this simple affair. When the trap, if it may be termed a trap, is set on the ground the principle involved is much the same. Here, however, the bait employed is usually a grain of yellow corn made soft by soaking it in water so the barb of the hook can be readily passed into it and be at once effective after swallowing, and

resistance follows by the turkey struggling to get free. This latter attempt is invariably defeated from the fact that the cord employed is so long that it allows the hooked bird to run about, without ever thinking to pull the long twine taut with the view of making the effort to tear the hook out, — an almost impossible feat at the best, especially if the bait has been entirely swallowed. Loose corn is always sprinkled around for several yards in all directions over the ground where the hook end of the string is set. This tends to deceive the feeding birds, and, sooner or later, one of them is pretty sure to pick up and swallow the one on the hook, and is at once made fast. Later on the negro will bag him by a knock on the head with the stick carried for the purpose. There is nothing to prevent baiting several localities in this way on the same day and evening, or setting several baits in any particularly good place where, in former times, a flock of turkeys were known to assemble.

With this brief account of the Wild Turkey's destruction in Virginia I close my remarks, and pass them over to our protectors of birds in this country.

Faithfully yours,

R. W. Shufeldt.

Washington, D. C.
31 Oct., 1910.

Concealing Coloration.

To the Editors of 'The Auk':—

Dear Sirs: — Now is the season for country readers of 'The Auk' to notice how the snow-covered roofs of houses match the sky, and are often all day, and generally all night, indistinguishable from the sky. Were men taller than these roofs, and were the snow confined to the roofs while the earth remained dark, they would see them against this dark ground and find them conspicuous just as they now do white birds, etc., that they commonly look *down* upon. Apparently naturalists are the only class of men who do not here recognize a principle that must of course apply to all white upward-facing surfaces seen against the sky. In England, in the Norfolk Broads, dark sails are now in use, because white ones did not show against the sky, and caused many collisions at night. (Dark sails are common in the harbors of many countries.) Yet, while these navigators thus show their knowledge of the invisibility of white against the sky, many naturalists still insist that white birds and other white or white-topped animals that need to be invisible against the sky are conspicuous from all view-points.

At the recent meeting of the A. O. U. I gave a short series of out-door demonstrations of the fact that the completeness of an animal's concealing-coloration depends upon his wearing samples of all the characteristic details of his back-ground. First I showed that a simple counter-shading conceals an object when it reproduces the one tone of a plain back-ground.

Then I introduced into this back-ground some white pebbles, until the spectator began to be able to detect the object by the extent of its eclipse of these pebbles. To restore its complete effacement I then gave its upward surfaces a few white spots that imitated the white pebbles of its back-ground, and instantly all suspicion of its existence was again removed. (All this is, of course, clearly set forth in our book.) Having thus called attention to this optical principle, I proceeded to show a typical example of its working in the vast class of species that are looked at by their prey or enemies against the sky, or *foliage with sky-holes through it*, and among whom upward-facing white markings are very common. Nature's wide-spread use of these white marks on aerial species is in startling contrast to the apparently total lack of them upon the vast world of species which, living away from water, dwell too low down, close to the ground, often to be looked at against the sky or sky-spotted foliage. My typical example was as follows: I showed a small stuffed deer placed just above the level of the eye and wholly indistinguishable, because, while his counter-shading reduced him to the uniform flat tone of the twiggery before and behind him, two bright white stripes running down his sides from his dorsal ridge, and a white spot on his head, absolutely passed for the sky seen through the flat twig element represented by his counter-shaded body, thus, as in the former case, perfecting the illusion. Not one of the two score or more spectators could detect the slightest difference between these counterfeit sky-holes and the neighboring real ones of the foliage back-ground, and of course not one of them, consequently, detected the deer, although each in turn stood within ten yards of him *and was shown exactly where to look*. For each spectator in turn I pointed right at the animal. They all agreed that it was the white sky-counterfeits that most completely prevented their detecting the deer. Ultimately I removed these white patterns, and the same spectators then easily distinguished the deer, although it occupied the very same place.

Upper surface white marks abound on aerial creatures and on such terrestrial ones as stand or leap high enough to have for their back-ground either sky or foliage with sky holes through it, and on all these species they work constantly the same magical effacement. Persons interested in this subject should read our book very carefully, as well as my letter to 'The Auk' of July, 1910, and my article in the 'Popular Science Monthly' for December, 1909. (I shall be delighted to send a copy of this latter article to any applicant.)

Let me add here a word about the flamingo to show how entirely his coloring belongs to the same class as that of all other sky-matching costumes of which my white striped deer was so convincing an example. (It is at least absurd to assert positively that the large denizens of the water he wades in, anacondas, alligators, etc., are not dangerous to him. C. G. Schillings found a goose in a crocodile's stomach.)

These birds are largely nocturnal, so that the only sky bright enough to show *any* color upon them is the more or less rosy and golden one that

surrounds them from sunset till dark, and from dawn until soon after sunrise. They commonly feed in immense open lagoons, wading, in vast phalanxes, while the entire real sky above them and its reflected duplicate below them constitute either one vast hollow sphere of gold, rose, and salmon, or at least glow, on one side or the other, with these tones. Their whole plumage is a most exquisite duplicate of these scenes. Whenever any student of this subject comes to believe that any sky matching whatever, like, for instance, a deer's, is adaptation and not accident, he will not continue to be astonished that this flamingo, having at his feeding time so nearly *only* sunrise colors to match, wears, as he does, a wonderful imitation of them. The public will soon be astonished when I show them a dawn picture *made out of* the entire skin of one of these birds simply 'mosaicked' into the sky of a painting of one of their lagoons. I am now making such a picture. I have already nearly finished a picture of a Himalayan gorge made wholly of the skins of Monaul pheasants; and another one of a New Hampshire snow scene similarly done with magpies. Artists are positively amazed by both of them.

Two other points I wish to cover in this letter. The first is based on the obvious fact that the most critical moment an animal ever *survives* is that one in which he barely escapes death. Imagine a crouching hare stalked and at last sprung upon by a fox or lynx. If the hare bound away in time, the arc of the predator's leap inevitably brings his face *down to the very ground* at the spot which the hare has just left, and from this viewpoint the hare's rump is *well up against the back-ground patch-work of foliage pierced with sky-holes* so absolutely counterfeited by his own white rump and dusky flanks. (If most people refuse to take the trouble to put their faces to the sod and see for themselves they must simply trust what I say.)

My other point is merely a clear reiteration of the little noticed fact that matching the background does not always mean coalescing with what chances at the moment to be behind the animal. It means matching the *potential* back-ground; in other words, presenting such an appearance as the beholder's eyes would naturally expect to see in such a situation. It is especially important to understand this principle in such a case as that of the flamingo. Under his circumstances to be a picture of dawn or sunset whose rosy hues are the strongest characteristics of the place and the hour, could not make him conspicuous to the minds of his sub-aquatic neighbors. It is simply his best gamble.

A. H. Thayer.

Monadnock, N. H.,
Dec. 8, 1910.

NOTES AND NEWS.

CHARLES OTIS WHITMAN, a Member of the American Ornithologists' Union, and an eminent teacher and investigator, died at his home in Chicago, of pneumonia, on December 6, 1910, at the age of 68 years. He was born at Woodstock, Maine, December 14, 1842. He was graduated at Bowdoin College in 1868, and received his A. M. degree from the same college in 1871. Afterwards he studied abroad, receiving the degree of Ph.D. from Leipzic University in 1878. In 1879 he was a Fellow at Johns Hopkins University, and Professor of Zoölogy at the Imperial University of Japan, 1880–81. He studied at the Naples Zoölogical Station in 1882, and was later Assistant in Zoölogy at Harvard University (1883–85), Director of the Allis Lake Laboratory (1886–89), Professor of Zoölogy at Clark University (1889–92), and head of the Department of Zoölogy and Curator of the Zoölogical Museum at the University of Chicago from 1892 till his decease. He was also Director of the Marine Biological Station at Woods Hole, Mass., from 1888 till 1908.

Dr. Whitman was a pioneer in developing modern methods of experimental research in zoölogy, and a leader in this field. To his ability and influence as a teacher and his resourcefulness in devising methods of attacking difficult problems in evolution many of the younger school of experimental biologists are greatly indebted for inspiration and guidance. He was also the founder and for many years the editor of the 'Journal of Morphology,' and was on the editorial staff of the 'Biological Bulletin' and other kindred publications. The results of his investigations were chiefly made known in his lectures on Biology (afterwards published) and in special papers. Among the leading subjects that occupied his attention are morphology, embryology, heredity, hybridization, and animal behavior. He devoted much time to the study of the evolution of color characters in Pigeons and to the natural history of this group of birds. He was elected to the National Academy of Sciences in 1895, and was also a member of the American Philosophical Society and the American Academy of Arts and Sciences, and the recipient of honorary degrees from various universities. A man of unusually attractive personality, he leaves a wide circle of friends to mourn his death, which is a heavy loss to science.

MANLY HARDY, a well-known naturalist, and for many years an Associate Member of the American Ornithologist's Union, died at his home in Brewer, Maine, December 9, 1910, at the age of 78 years and 28 days. He was born in Hampden, Maine, November 11, 1832, an only son of Jonathan T. Hardy. Four years later the family moved to Brewer, Maine, and seven years later into the house on Wilson Street which has since been the home of the family, and has become so well known to many students of natural history through their visits to the subject of this biographical notice.

For a time Manly Hardy attended the common schools of Brewer, but was later a pupil in the private classes of the late Rev. George W. Field, D. D. At this early period of his life he contemplated a career in foreign lands as a missionary, but an injury to his eyes compelled him to abandon this desire; but he maintained throughout life a strong interest in religious work. With the development of ill health he sought the woods of his native State for recuperation, where he spent much of his time for many years, finally becoming an extensive fur buyer and large shipper of furs to foreign markets. This life brought him into close association with trappers and woodsmen, mainly Indians and "silent white men." Under such environment he acquired a keen insight into nature's secrets, and became an authority on the language and traditions of the Indians with whom he was thus brought into close association. For a time, in 1861, he was connected with the Maine State Scientific Survey.

In the words of a local biographer: "Early in life Mr. Hardy began to take a lively interest in the birds, but it was not till he was over 40 years of age that he began his collection. When in 1890 he gave up active business, he devoted more and more of his attention to adding rare and unusual specimens to what is regarded as one of the finest private collections of mounted and unmounted bird skins in the country." His collection, it is said, embraces nearly every species of North American bird, and numbers some 3,300 specimens, mostly mounted by himself.

His interest in wild life and his intimate knowledge of birds and animals brought him into close association with many prominent naturalists, among them being the late Major Bendire, to whose work on the 'Life Histories of North American Birds' Mr. Hardy contributed much valuable information, He was not, however, much given to making public record of his observations. Between 1878 and 1889 he was an occasional contributor to the 'Bulletin' of the Nuttall Ornithological Club and 'The Auk,' but his natural history communications were mainly published in 'Forest and Stream,' to which well known journal he was a valued contributor of natural history articles for nearly forty years. These were generally instigated by some erroneous statement by others in the columns of his favorite medium of communication, and with facile and vigorous pen he then drew freely upon his store of positive fact concerning the matters at issue.

Mr. Hardy was elected an Associate Member of the American Ornithologists' Union at its first meeting and he retained this membership till 1901. He was also a member of the Bangor Historical Society. He was held in high esteem by all who knew him, and his acts of charity and goodwill will be long remembered by those whose good fortune it was to know him personally. His end came suddenly, although not unexpectedly, after little more than a day's illness. Of his five children still living, one, Mrs. Fanny Hardy Ecstorm, is well known to readers of 'The Auk' through her important contributions to ornithological literature.

It is with deep regret that we announce the serious illness of Mr. William Dutcher, President of the National Association of Audubon Societies, who was stricken with apoplexy at his home in Plainfield, New Jersey, on October 19 last. This was followed by a long period of unconsciousness and by paralysis of the right side. No complications having ensued, his physicians have hope of his continued improvement.

Mr. Roy C. Andrews, Assistant in Mammalogy at the American Museum of Natural History, has recently returned from a trip around the world in the interests of the Museum. He joined the scientific staff of the 'Albatross' in the Philippines in October, 1909, visiting during the next five months various parts of the Dutch East Indies. During this cruise he made an important collection of birds and mammals, besides obtaining much valuable anthropological and other natural history material. Later, after the close of the 'Albatross' cruise, he spent six months in Japan at the whaling stations, and secured skeletons of nearly all the species of large whales and of some of the dolphins that frequent the coast of Japan.

The American Museum of Natural History Stefánsson-Anderson Expedition to Arctic America left New York in April, 1908, for several years of research in zoölogy and anthropology along the Arctic coast, Dr. R. M. Anderson being in special charge of the zoölogical work. During 1909 they explored westward to beyond the Colville River, and in 1910 returned eastward to study the coast district as far as the Coppermine River. Notwithstanding many difficulties and much hardship, their work has been to a large degree successful. A few weeks since the collections made in 1909 have reached the Museum, and include several hundred bird skins, many nests and eggs, and a valuable collection of mammals, among which are good series of white sheep and Barren Ground caribou.

In the April Number of this journal (Auk, XXVII, 1910, pp. 241, 242) reference was made to the Kuser Asiatic Expedition, under the auspices of the New York Zoölogical Society, giving some account of its organization and purposes, and announcing the sailing of Mr. C. William Beebe and Mrs. Beebe for London, en route to India. They were joined in London by Mr. Bruce Horsfall as artist, and the party sailed direct for Ceylon. After several weeks spent in Ceylon, a visit was made to the Darjiling district of the Himalayas, and later to Borneo and Burma. Mr. Horsfall returned in August, 1910, but Mr. and Mrs. Beebe will remain till probably June or later of the present year, extending their work to Cochin China, and probably also to Formosa, Sumatra and Java. Thus far they have met with excellent success in obtaining specimens of the Pheasants of the regions visited, and in investigations of the life histories and ecology of the Phasianidæ, which are the primary objects of the expedition.

SEVERAL American naturalists are at present making collections of birds and mammals in different parts of Venezuela and other portions of northern South America, Mr. M. A. Carriker, Jr., being in northern Venezuela, in the interests of the Carnegie Museum of Pittsburgh and the American Museum of Natural History, and Mr. Wilfred H. Osgood in the interest of the Field Museum of Chicago; Mr. William B. Richardson is collecting in western Colombia for the American Museum, and the Academy of Natural Sciences of Philadelphia will soon have representatives in eastern Venezuela. Mr. S. H. Rhoads is also about to visit Ecuador to collect mammals and birds in the higher parts of the Andes.

FOR some time past a Biological Survey of the Panama Canal Zone has been under consideration, to be carried out under the direction of the Smithsonian Institution. The plans for the survey having now been matured, and the necessary financial support secured, several well-known biologists are already on their way to begin the work. The importance of such a survey is evident, the fauna and flora of the region being at present not well known, while it is certain that considerable changes must result from the completion of the canal, when the organisms of the various watersheds will be able to mingle, and existing biologic conditions be considerably modified. In order to determine the nature and extent of these changes it is necessary to secure full knowledge of the present fauna and flora. In carrying forward the survey the gathering of birds and mammals will be under the direction of Mr. E. A. Goldman of the Biological Survey; Mr. S. E. Meek, of the Field Museum of Chicago, and Mr. S. F. Hildebrand of the Bureau of Fisheries will have charge of the field work in connection with reptiles and fishes, and also make collections of mollusks and crustaceans; Messrs. E. A. Schwartz and Mr. August Busck of the U. S. National Museum and the Bureau of Entomology will be in charge of the entomological work, and other departments will be in charge of experts from other Government Bureaus. It is to be hoped that the survey will be well sustained financially, and the results of the work all that could be desired.

SPOON-BILL SANDPIPER

Figs. 1, 2, 4.—Bill of Newly Hatched Young.
Figs. 3 and 5. Bill of Adult.

EGGS OF SPOON-BILL SANDPIPER